GOVERNMENT OF SINDH

MEAT
Sector Development Strategy

2023-2027




The Meat Sector Development Strategy is an official document of the Government of Sindh.

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The Strategy was developed using the process, methodology and technical assistance of the international Trade Centre (ITC) within the framework of its Trade Development Strategies Programme (https://www.intracen.org/trade-strategy/).

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Note for the reader

The Meat Sector Development Strategy, Sindh, was developed under the Growth for Rural Advancement and Sustainable Progress project based on a participatory approach, during which more than 30 industry leaders, small business owners and public-sector representatives from Sindh held consultations to reach consensus on key sector competitiveness issues and priority activities.

Besides in-depth qualitative and quantitative research and a value chain analysis, national consultants conducted visits and interviews with provincial firms and institutions to provide insights, market intelligence and buyers' requirements in terms of quality standards, food safety, packaging, distribution channels and prices, etc.

The Meat Sector Strategy builds on the ongoing initiatives in livestock development and private sector investment and is aligned with the Sindh Livestock Policy. Equally important is the effort of the sector strategy initiative to establish the proper implementation responsibilities among key stakeholders early on to ensure timely implementation of activities, whether by the public sector, private sector or international development agencies. The principal output of this Strategy is an endorsed, coherent and comprehensive document with a detailed five-year Plan of Action and implementation management frameworks.

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A complete list of public and private stakeholders that contributed their precious time to the design of this Strategy is detailed in Annex 1: Complete list of participants in the public–private consultations.

Contents

LIST OF FIGURES

LIST OF TABLES

LIST OF BOXES

Acronyms and abbreviations

Unless otherwise specified, all references to dollars ($) are to United States dollars, all references to tons are to metric tons, and all references to Departments are to Departments of the Government of Sindh.

The following acronyms and abbreviations are used:

AI	artificial insemination
AQD	Animal Quarantine Department
CAGR	compound annual growth rate
DCFA	Dairy and Cattle Farmers Association
DoASP	Department of Agriculture, Supply and Prices
DoLF	Department of Livestock and Fisheries
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FMD	foot and mouth disease
GCC	Gulf Cooperation Council
GoS	Government of Sindh
HS	Harmonized System
ITC	International Trade Centre
JICA	Japan International Cooperation Agency
LDC	Livestock Development Council
MNFSR	Ministry of National Food Security and Research
OIE	World Organization for Animal Health
PCSIR	Pakistan Council of Scientific and Industrial Research
PDA	Pakistan Dairy Association
PDD	Planning and Development Department
PKR	Pakistani rupee
PoA	Plan of Action
PPP	public–private partnership
PSQCA	Pakistan Standards and Quality Control Authority
R&D	research and development
SAU	Sindh Agriculture University
SBBUVAS	Shaheed Benazir Bhutto University of Veterinary and Animal Sciences
SDS	Sector Development Strategy
SEDF	Sindh Enterprise Development Fund
SEPA	Sindh Environmental Protection Agency
SFA	Sindh Food Authority
SIAH	Sindh Institute of Animal Health
SPPRA	Sindh Public Procurement Regulatory Authority
SPU	semen production unit
SPV	special purpose vehicle
TAD	transboundary animal disease
TDAP	Trade Development Authority of Pakistan

Executive summary

The Livestock and Fisheries Department (DoLF), commissioned the design of the Meat Sector Development Strategy (SDS). This five-year Strategy forms an integral part of the Sindh Livestock Development Policy and was developed through a consultative process between public and private sector stakeholders. It seeks to build a sustainable, competitive and integrated supply chain for the meat sector in Sindh. It focuses on enhancing the productivity and production of the industry and controlling livestock diseases. Importantly, the Strategy aims to foster private-sector-led development, with the public sector providing an enabling environment through policy interventions. Achieving this ambitious objective requires the active participation of the meat sector, including monitoring progress and mobilizing resources to implement the Plan of Action (PoA) successfully.

The red meat industry in Sindh: a promising sector for export growth that plays an important socioeconomic role

Pakistan is endowed with one of the world's largest livestock populations, which has immense – yet unrealized – export potential for meat products. With an estimated 25.3 million bovines, Sindh has the second-largest herd of bovines in Pakistan after Punjab (27%). It also has about 25% of the national goat population and 16% of the national sheep population. The livestock sector is an essential contributor to the socioeconomic development of Sindh, providing livelihoods, nutrition and economic benefits to the population. Notably, it provides substantial revenue to rural households engaged in subsistence livestock production.

In Sindh, the meat sector remains informal. It is mainly dominated by a rural subsistence production system, whereby livestock is primarily reared by smallholders who keep an average of three to five animals that primarily produce milk for the household. Consequently, livestock farmers prefer rearing heifers to male calves; the latter are generally considered a liability and culled at a young age. Under this traditional system, animals achieve much lower average carcass weight than other major international meat suppliers, significantly affecting the industry's export competitiveness.

The red meat sector is also an essential source of foreign exchange earnings through its exports, particularly in the beef subsector. Pakistan has been one of the fastest-growing meat exporters over the past decade, capitalizing on the country's competitive advantage in supplying chilled beef as carcasses to countries from the Gulf Cooperation Council (GCC). In 2021, Pakistan generated about $310 million in export revenue from meat exports, of which $245 million was from bovine meat exports (United Nations Comtrade, https://comtradeplus.un.org/), making meat – and beef in particular – the country's leading agricultural export product. About half of it originates from the 10 Sindh-based meat-processing companies that are export-oriented.

The tremendous untapped export potential is yet to be harnessed through market and product diversification. Exports from the sector are almost exclusively concentrated in the fresh carcass niche market to GCC countries, where the industry has a competitive edge. The meat sector takes advantage of its capacity to supply these markets with chilled halal meat that is affordable due to competitive transportation costs. The concentration of Pakistan's exports in terms of products and markets is, however, exposing the export sector to exogenous economic and demand shocks in these countries.

Several limiting factors along the value chain are impeding export growth

While the local industry is well-placed to become a major red meat supplier in the international market, several bottlenecks and challenges still need to be addressed. Various sources estimate that export-oriented meat processors operate at 25% to 40% of their maximum capacity. The low carcass weight observed in the Pakistan meat sector and the lack of indigenous beef breeds prevents local meat processors from capturing international markets beyond the chilled meat markets of the GCC / Middle East. Resources should also be mobilized to improve animal nutrition, adopt good husbandry practices and encourage investments in commercial farms rearing livestock for meat production. Another critical issue impeding export growth is the limited market access for locally processed meat, mainly due to the prevalence of foot and mouth disease (FMD) in Pakistan. This concern and the need for more livestock traceability restrict Pakistan's access to most importing countries.

In Sindh, meat processing and marketing are done through two distinct channels. Sindh has 85 registered municipal slaughterhouses catering to domestic market needs, together with government-approved slaughterhouses or private abattoirs. These facilities are often characterized by poor hygienic conditions, limited technology and a lack of cold chain protocols, affecting the safety and quality of the meat produced. In the domestic market, a large share of the livestock is also culled at facilities that are not recognized by the government and that usually lack essential equipment and proper hygiene management. The prevalence of unregulated practices coupled with a weak and outdated regulatory framework results in export-oriented slaughterhouses catering exclusively to the needs of international markets because they cannot compete on a level playing field with domestic wet markets that do not bear high hygiene compliance costs.

To unlock the tremendous export potential of the meat industry in Sindh and move up the global value chain, the sector will need to work collectively to achieve the necessary structural improvements at all stages of the value chain, starting at the farm level.

The strategic framework

The present Strategy provides a roadmap and a PoA geared towards achieving the following overall vision for the development of the meat sector in Sindh:

'A sustainable, competitive and integrated meat sector in Sindh that thrives in an enabling business and regulatory environment'

Agreed upon by all stakeholders in the meat value chain in Sindh, this vision statement delineates this Strategy's proposed strategic objectives. The Strategy's PoA responds to this vision by comprehensively addressing the sector's constraints and leveraging opportunities. To this end, specific efforts will be made in the following strategic directions.

Figure 1: Strategic and operational objectives of the Meat SDS 2023–2027

Strategic objective 1 **Create an enabling environment for sustainable private-sector-led growth in the meat sector**	• 1.1. Streamline and simplify the institutional, legal and regulatory framework • 1.2. Ensure access to reliable livestock data • 1.3. Strengthen food safety and quality management in the meat sector
Strategic objective 2 **Improve the productivity and profitability of livestock production while building climate change resilience**	• 2.1. Promote climate-smart feed production for optimal animal nutrition • 2.2. Foster genetic improvement of local livestock breeds • 2.3. Reduce the mortality rate of male calves and implement improved practices across the entire value chain
Strategic objective 3 **Develop a sustainable, integrated and disease-free livestock supply chain and increase local value added**	• 3.1. Foster efficient management and control of transboundary animal diseases and improve livestock traceability • 3.2. Develop an integrated and sustainable meat industry with strong supply chains, logistics and green energy solutions • 3.3. Increase local value added and strengthen market links

Firstly, the Strategy aims to simplify and streamline the institutional, legal and regulatory framework that governs the meat sector. This will reduce bureaucracy and administrative hurdles, and harmonize standards and regulations across different regions and jurisdictions, in line with the Eighteenth Amendment of the Constitution of Pakistan, which devolved many powers and responsibilities related to agriculture and livestock from the federal government to the provinces. Consistent with the Sindh Livestock Policy, the Meat SDS also emphasizes the role of the Government of Sindh (GoS) as regulator, focusing on creating a regulatory framework conducive to private sector development and supporting domestic and foreign investment.

The availability and quality of data related to the livestock sector should be urgently improved to facilitate evidence-based decision-making and planning, identify areas for improvement, and promote transparency and accountability in the meat sector.

Enhancing food safety and quality management systems in the meat sector in line with international best practices is also urgently required, notably to improve hygiene and sanitation practices in the domestic market, enhance consumer confidence, promote exports and safeguard public health.

Secondly, the Strategy focuses on increasing the productivity and profitability of livestock production. In particular, it seeks to enhance animal yield per unit by improving veterinary health coverage, husbandry practices, animal breeding practices, artificial insemination (AI) services, and production and use of improved, locally produced feed and fodder. In addition, it aims to reduce the mortality rate of male calves by establishing community-level male calf-rearing and -dealing centres and improving practices for meat production across the entire value chain.

Lastly, the Strategy seeks to develop a sustainable, integrated and disease-free livestock supply chain. To achieve this objective, a first set of actions has been designed to manage and control transboundary animal diseases (TADs) efficiently. These actions include establishing disease-free compartments and zones, producing and distributing vaccines and medication in Sindh, and developing animal registration and traceability systems. The Strategy also aims to facilitate the establishment of modern slaughterhouses and promote commercial livestock rearing for meat production while fostering green energy solutions and ensuring a reduced operational impact on the environment. Value-added and enhanced market links for export-oriented meat processors will be encouraged to strengthen the competitiveness of the Sindh meat sector in international markets.

These objectives are designed to promote sustainable and resilient livestock production systems, enhance food security and nutrition, and contribute to overall economic development through increased export earnings. The livestock sector in Sindh has great socioeconomic importance and its development can significantly contribute to poverty alleviation and inclusive socioeconomic development of rural communities, notably fostering women's empowerment and creating more opportunities for women and youth.

Implementation management

The Strategy has considered current capabilities, constraints and future shifts and opportunities for Sindh's meat sector. It presents a pragmatic and forward-looking roadmap for upgrading and internationalizing the sector, which can be successfully driven through timely and appropriate resource allocation, and implemented through effective public–private collaboration.

Accordingly, a Livestock Development Council (LDC) and a subcommittee dedicated to the meat sector in Sindh shall be established, operationalized and empowered. The subcommittee shall be responsible for overall coordination, provision of rapid and viable solutions to regulatory and procedural bottlenecks, policy guidance and monitoring of industry development against the Strategy's objectives.

The Meat SDS in Sindh focuses on red meat (beef and mutton). Several reasons motivated this approach.

- **Greater socioeconomic impact:** The red meat industry has a more dispersed socioeconomic impact across the supply chain and involves many stakeholders – such as farmers, traders, butchers and meat processors – potentially generating more job opportunities and economic activity than other subsectors, such as poultry.
- **Greater export potential:** The global demand for red meat is higher than for poultry, particularly in the Middle East and Southeast Asia. This presents an opportunity to increase red meat exports and promote the sector's growth. In contrast, the poultry industry is currently almost exclusively focusing on the domestic market.
- **Greater potential for the development of small and medium-sized enterprises:** The poultry industry is dominated by a few large companies with a high level of vertical and horizontal integration, making it difficult for small businesses to compete. In contrast, the red meat supply chain has a more diverse range of actors, allowing for more inclusive economic development.
- **Unique value chain:** The red meat industry has distinct supply chain requirements, market dynamics and stakeholder relationships, requiring a separate development strategy from poultry.

A global meat industry that keeps growing and evolving

A booming global market dominated by the frozen meat segment

The booming global market for bovine meat is shifting from fresh or chilled beef to frozen beef. In 2021, the global trade in bovine meat (excluding offal) exceeded $60 billion (United Nations Comtrade). The industry has shown dynamism in recent years, growing at a healthy compound annual growth rate (CAGR) of 7.5% between 2017 and 2021. After a contraction of 3.7% in 2020 due to the COVID-19 pandemic, the sector recovered rapidly, showing resilience, as bovine meat imports globally progressed at a growth rate of 20.3% in 2021 (year on year). China, the United States of America and Japan are the largest importers of bovine meat globally, with market shares of 21%, 13% and 7% in 2021, respectively (United Nations Comtrade).

International sales of bovine meat have been boosted by the spectacular increase in demand for frozen products, particularly from Asia. In recent years, frozen beef, which accounted for 52% of global bovine meat imports in 2021, has emerged as the largest category of imports, outperforming the chilled or fresh market segment (see Figure 3). Chinese imports of bovine meat, consisting almost exclusively of frozen beef, have surged in recent years from approximately $3 billion in 2017 to over $17 billion in 2022 (United Nations Comtrade), equating to over 38% of global imports of frozen beef (adding up to 45% if also considering Greater China[1]). Strong demand for frozen beef is also emerging from East Asia and Southeast Asia, mainly from Malaysia, Indonesia and Viet Nam. The member states of the Association of Southeast Asian Nations emerged as the second-largest importers of frozen bovine meat, with an imported value of $2.6 billion or 8.4% of global trade in 2021. Demand from these countries is anticipated to increase in the short to medium term as increased per capita incomes may lead to greater beef consumption. Other Asian economies, including the Republic of Korea and Japan, are also among the leading importers of frozen beef, with market shares of approximately 7% and 5%, respectively.

Figure 2: Global imports of fresh or chilled and frozen bovine meat (Harmonized System (HS) 0201 and HS 0202), 2012–2021 ($ billions)

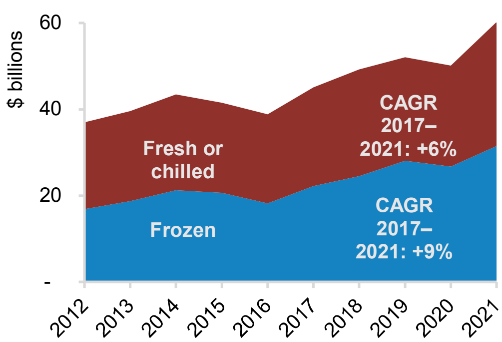
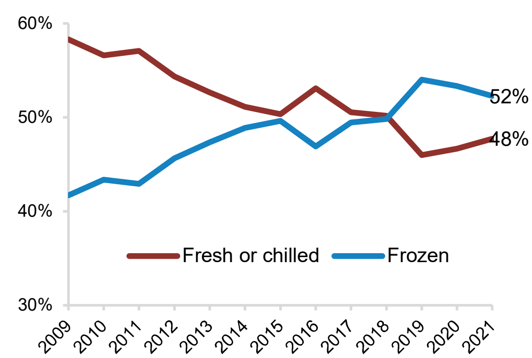


Figure 3: Share of fresh or chilled and frozen beef in global bovine meat imports, 2009–2021 (% based on value)



Source: ITC calculations based on United Nations Comtrade statistics.

Global demand for bovine meat products is concentrated in the boneless meat category, in both the fresh or chilled and frozen market segments. Among the three main product categories, namely carcasses (including half-carcasses), cuts with bone in and boneless meat, the latter accounts for 91% and 74% of the world's imports of frozen and chilled bovine meat, respectively (see Figure and Figure 5). In contrast, the global demand for carcasses, which currently account for the bulk of Sindh's – and Pakistan's – beef exports, is limited, constituting a mere 8% of chilled beef imports in 2021 (United Nations Comtrade).

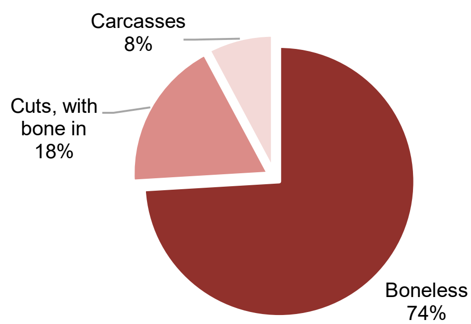
In high-income countries, the relatively stable demand for bovine meat is dominated by chilled boneless beef, particularly superior-quality cuts, which fetch higher prices. With a market share of 18%, the United States is by far the world's largest importer of fresh or chilled beef. The European Union (including the United Kingdom of Great Britain and Northern Ireland), the United States and Japan are responsible for more than 68% of the global demand for fresh or chilled bovine meat. Consumers in these markets increasingly demand quality and safety, with growing health consciousness changing consumption patterns. Accordingly, the demand for traceable meat products, standardized labelling rules and standards for the meat industry has increased. European Union (EU) Member States and the United Kingdom captured more than 42% of the world's chilled beef imports in 2021, suggesting consumer preferences for superior-quality cuts. EU imports are slowing because of the progressive decline in per capita intake of bovine meat in several European

[1] Greater China encompasses mainland China, Hong Kong (China), Macao and Chinese Taipei.

countries, partly caused by growing environmental concerns and the progressive shift towards more sustainable consumption patterns.

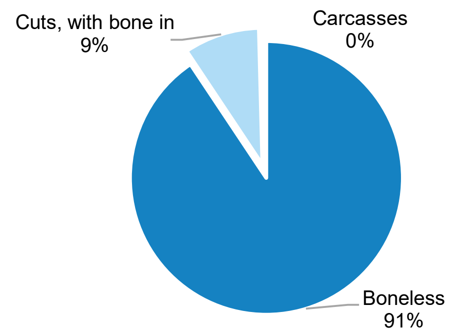
Non-Muslim suppliers are leaders in the main halal meat markets. While the largest exporters of bovine meat – including Brazil, Australia, the United States and India – are non-Islamic countries, they nevertheless have internationally recognized halal accreditations and cater to the demand of Muslim countries as well. For example, most Indian exports of frozen bovine meat are destined for Asian Muslim countries (about 53% in 2020). Halal meat does not have to be produced in Muslim countries to be competitive in the global halal meat markets; rather, exporters must have halal certifications and conform with Muslim countries' labelling requirements.

Figure 4: World imports of fresh or chilled bovine meat (HS 0201), 2021 (% based on value)



Top importers	Imported value, 2021 ($ millions)	Market share (%)	CAGR 2017–2021 (%)
EU27+United Kingdom	11 657	42.3	1.1
United States	4 974	18.0	15.4
Japan	2 202	8.0	3.4

Figure 5: World imports of frozen bovine meat, 2021 (% based on value)



Top importers	Imported value, 2021 ($ millions)	Market share (%)	CAGR 2017–2021 (%)
China	11 890	38.3	41.2
Association of Southeast Asian Nations	2 716	8.7	12.9
United States	2 639	8.5	4.4
EU27+United Kingdom	2 573	8.3	3.5
Republic of Korea	2 135	6.9	8.4

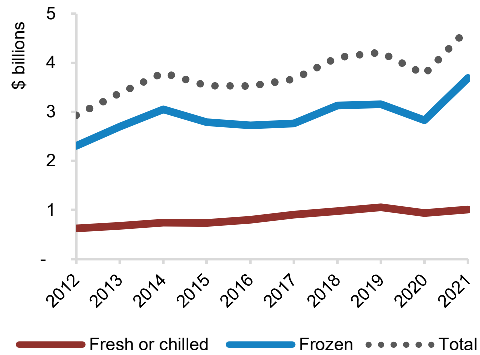
Source: ITC calculations based on United Nations Comtrade statistics

In addition to the fresh and frozen meat market segments, niche markets exist for bovine offal and further-processed, value-added bovine meat products. Along with meat consumption, international demand for edible entrails and internal organs (offal) of bovine animals has followed an upward trend in the past decade, reaching approximately $4.7 billion in 2021 (United Nations Comtrade, 2021).[2] Frozen bovine offal largely dominates demand (76%) (see Figure 6). Hong Kong (China) and Japan are the world's largest importers in the frozen and fresh / chilled market segments, respectively.

A niche market also exists for processed beef, categorized under HS 160250 'Prepared or preserved meat or offal of bovine animals (excluding sausages, and similar products)'. Global imports of these products reached a record high of $2.5 billion in 2021, dominated by North America (accounting for 36% of global imports in 2021) and European countries (30%), chief among them the United Kingdom and Germany.

Figure 6: World imports of edible offal of bovine animals (HS 0206), 2012–2021 ($ billions)

[2] Considering products classified under HS 020629 'Frozen edible bovine offal (excluding tongues and livers)', HS 020610 'Fresh or chilled edible offal of bovine animals', HS 020622 'Frozen edible bovine livers' and HS 020621 'Frozen edible bovine tongues'.



Source: ITC calculations based on United Nations Comtrade statistics.

Global trends in the sheep and goat meat market

The fast-growing global market for sheep and goat meat (categorized under HS 0204) reached $8.8 billion in 2021 (United Nations Comtrade), boosted by a dynamic frozen market segment. 'Sheep cuts with bone in' is the category most in demand in international markets, whether chilled or frozen, with a share of 54% in total goat and sheep meat imports in 2021. Carcasses, which Pakistani exports currently concentrate on, account for approximately 24% of international demand for sheep and goat meat, 69% of which is fresh or chilled (see FFigure).

Important market destinations for sheep and goat meat include the EU (capturing 29% of global imports in 2021), China (27%), the United States (16%) and GCC countries (10%). Demand from Eastern markets – particularly Malaysia, the Republic of Korea and Japan – is also growing rapidly. As in the beef sector, high-income countries tend to import mainly chilled products, while developing countries primarily have demand for frozen items. For example, China, which is by far the largest importer, almost exclusively buys cuts of sheep with bone in, mainly from New Zealand and Australia.

Figure 7: World imports of sheep and goat meat (HS 0204), 2012–2021 ($millions)

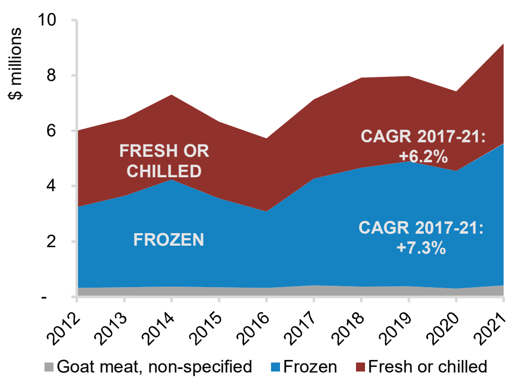
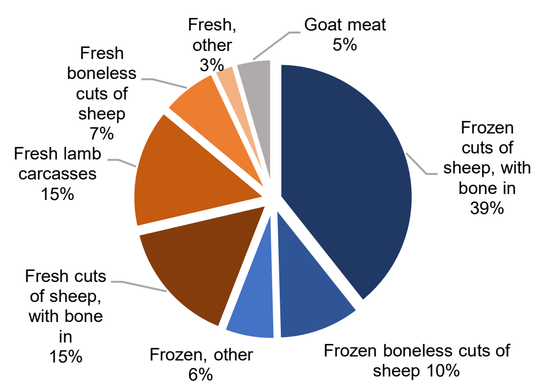


Figure 8: World imports of sheep and goat meat (HS 0204), 2021 (% based on value)



Source: ITC calculations based on United Nations Comtrade statistics.

Box 1: International market trends – key takeaways

- Driven by the booming demand from China and other developing Asian countries, frozen meat recently emerged as the dominant meat market segment in global trade and is expected to grow. Improving the local meat industry's price competitiveness and ensuring market access to these countries are prerequisites to taking advantage of this promising market.
- High-income countries continue to dominate the fresh or chilled market segment, with consumers willing to pay a premium for higher-quality chilled prime cuts. Stringent food safety standards are required to

penetrate this highly demanding market. The increasing demand for meat products' traceability also requires exporters to introduce standardized labelling rules and quality standards to enter these markets.

- Local industry players pursuing market diversification should consider shifting resources towards processing boneless meat products because this product category, whether chilled or frozen, is by far the most in-demand in international markets.
- A limited number of highly competitive players dominate the global meat trade, including Brazil, Australia, the United States and India. Competing with these suppliers can only be achieved by significantly reducing livestock production costs and increasing carcass weight.
- Halal meat production does not give local processors a competitive edge in Muslim countries given that the leading exporters to Muslim countries are non-Muslim countries.
- Ready-to-eat food products, including prepared or preserved meat, have experienced growing demand in recent years, boosted by increasing urbanization and the associated demand for convenience. This is a promising market segment for Sindh's meat processors because heat-treated products are not subject to the same hygiene regulations as minimally processed - or raw - meat products, allowing exporters to circumvent the restrictions associated with FMD.

These market trends should guide the future development of the export-oriented meat industry in Sindh, starting with a strong emphasis on increasing the breeding of livestock for meat production to become price competitive in international markets and gain greater market shares.

The meat sector in Sindh

This section provides an overview of the current state of the meat sector in Sindh and highlights the most significant segments and trends of the domestic and export markets.

The socioeconomic importance of the livestock sector in Sindh

The livestock sector is an essential contributor to the socioeconomic development of Sindh, providing livelihoods, nutrition and economic benefits to the population.

Livestock is a major source of income and employment for many people in the rural areas of Sindh. Many smallholders rely on livestock for their livelihoods, and the sector provides many employment opportunities, including in animal husbandry, transportation and processing. At the national level, it is estimated that more than 8 million rural families are engaged in livestock production, deriving more than 35% to 40% of their income from this source (Pakistan Ministry of Finance, 2021). In Sindh, approximately 2.4 million households are engaged in the livestock sector, accounting for about 12% of the province's total households (Pakistan Bureau of Statistics, 2017). Animal husbandry plays a vital role in the local economy as most rural households keep a buffalo, a cow or a goat for milk production and meat consumption, although meat is often considered a by-product stemming from mature adults and young males. Livestock also serves as a secondary income for rural subsistence smallholdings because they can sell the livestock in times of need. This provides security against crop failure, particularly in *barani* areas. The sector is also important for women, who are often involved in major livestock management activities such as feeding, watering and housing, while men are involved in marketing.

Livestock is a key source of protein for the population of Sindh, particularly for those who cannot afford to buy meat. In addition, livestock products such as milk and meat are essential sources of nutrition, especially for children. Bovine, ovine and caprine meat is also an important source of high-quality protein, iron and vitamins in the local diet. Driven by population growth, urbanization and rising per capita income, domestic demand for meat and meat products constantly increases.

The livestock sector contributes significantly to the national economy of Pakistan, and Sindh is one of the main contributors to the country's livestock production. The livestock subsector adds the most value to national agriculture, contributing 61.89% of the entire agricultural economy and 14.04% of the country's gross domestic product in 2021-2022 (Pakistan Ministry of Finance, 2021). At the national level, livestock achieved a growth of 3.3% year-on-year from 2021 to 2022, with a gross value added of PKR 5,441 billion (at constant basic prices of 2015/16) (Pakistan Bureau of Statistics, 2017). At current prices, the contribution is about PKR 6,661 billion.

The meat sector is also essential for foreign exchange earnings in Pakistan. With earnings estimated at $310 million in 2021, meat – and particularly beef – has progressively emerged as a major agricultural export in terms of revenue (United Nations Comtrade).[3] The meat sector accounts for 6.9% of the country's total agricultural product exports in 2021, second only to rice (54.6%) and fish and crustaceans, molluscs and other aquatic invertebrates (9%).[4] The sector's contribution to Pakistan's total product exports reached 1.1% in 2021 (United Nations Comtrade).

More data is required at the provincial level to accurately evaluate the economic impact of the meat sector in Sindh. It is essential to establish proper data collection mechanisms to gain a better understanding of the sector's dynamics. This will enable policymakers to develop effective and targeted strategies and plans.

A major producing region in one of the largest meat-processing countries in the world

Sindh is endowed with a vast production base

Sindh has Pakistan's second-largest herd of bovine animals and small ruminants after Punjab. The population of bovine animals in Sindh was estimated at 25.3 million heads in 2019/20, or about 27% of the national herd (compared to 14.3 million according to the 2006 livestock census). In 2019, Sindh was home to

[3] The figures for meat exports are of red meat categorized under HS 0201 'Meat of bovine animals, fresh or chilled', HS 0202 'Meat of bovine animals, frozen' and HS 0204 'Meat of sheep or goats, fresh, chilled or frozen' and do not include edible offal.
[4] Considering live animals; animal products classified under HS codes 01 to 05 and vegetable products classified under HS codes 06 to 14.

about 19.9 million (25%) of the Pakistani goat population and 5.1 million (16%) of the sheep population (see **Error! Reference source not found.**) (GoS Directorate of Animal Husbandry).

Meat production is mainly geared towards the local market and is characterized by low yield

Pakistan's beef production was estimated at 2.461 million tons in FY 2021/22 (Ministry of National Food Security and Research (MNFSR), 2018), making Pakistan the seventh-largest producer of bovine meat globally (FAOSTAT, www.fao.org/faostat/en/, 2020).[5] Unlike other large beef producers, except India, a large share of the cattle meat produced in the country consists of buffalo meat (about 49%). Pakistan also processed an estimated 782,000 tons of mutton in FY 2021/22, about two-thirds consisting of goat meat (67%) (MNFSR, 2018).

At the provincial level, the collection of meat sector data must be systematized and organized. Nevertheless, the slaughter of an estimated 328,000 bovines and 867,000 small ruminants in Sindh in 2019/20 has provided an insight into red meat production in the province (GoS Directorate of Animal Husbandry) (see **Error! Reference source not found.**). A significant limitation of the analysis is that the number of animals slaughtered in Karachi is not reported in the total for Sindh.

Box 2: The veracity of estimates for the livestock population and meat production are contested

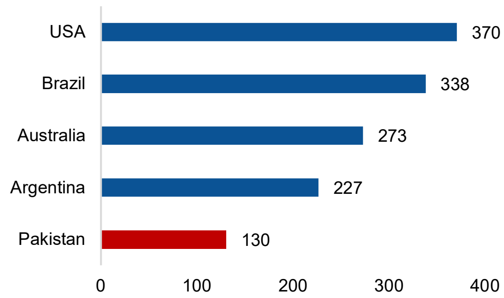
- Livestock numbers are determined by applying a fixed growth rate to the projected population each year at both the federal and provincial levels. The fixed growth rate is based on the inter-census growth rate from the 1996 and 2006 livestock censuses. However, the population of small ruminants is thought to be largely overestimated as severe shortages of sheep and goats have been observed in the market in recent years, interrupting the animal supply chain. Further, the massive production and export of goat meat destined for GCC markets over the past decade has contributed to the depletion of the small ruminant population. These factors have not been reflected in the calculation method for the livestock population.
- Similarly, meat production data should be interpreted with care as the figures for red meat production (excluding edible offal) are not based on empirical data but calculated by applying production parameters to the projected livestock population based on the inter-census growth rate of the 1996 and 2006 livestock censuses.

The average carcass weight is very low in Pakistan. Compared to the largest meat-producing countries, the yield gap for cattle meat produced in Pakistan is abysmal. The average carcass weight of cattle – or yield – in Pakistan was estimated at 130 kg per animal in 2020, far below the 370kg and 338kg per animal observed in the United States and Brazil, respectively (FAOSTAT, www.fao.org/faostat/en/) (see Figure9). This low yield deeply affects the competitiveness of the export-oriented bovine meat industry, preventing it from competing in the same market segments as the above-listed competitors. In addition, the minimum carcass weight requirements imposed in certain countries do not allow local meat processors to enter these markets, even if exports are technically allowed. Low carcass weight is mainly attributed to the limited presence of meat breeds in Pakistan – and the fact that cattle are primarily reared for milk production – as well as poor farming practices and inadequate animal nutrition.

Similarly, yields observed in the small ruminant subsegment are relatively low and variable. The average carcass weight of a goat slaughtered in Pakistan was estimated at 11.7 kg in 2020, significantly lower than the yield of 15.7 kg per animal observed in China but higher than the 10 kg per animal reported in India. Overall, the supply could be considerably expanded to meet rising domestic and regional demand. This needs to be done by increasing productivity rather than numbers, which can be achieved through better animal breeds, a greater focus on preventive health care, improved husbandry and careful rangeland management.

[5] After the United States, Brazil, China, Argentina, India and Australia. Pakistan's production of fresh or chilled bovine meat in 2020: 2.297 million tons, comprising 1.179 million tons of cattle meat with bone in, fresh or chilled and 1.118 million tons of fresh or chilled buffalo meat.

Figure 9: Carcass weight of cattle in the main production areas, 2020 (kg/animal)



Source: FAOSTAT (www.fao.org/faostat/en/).

Box 3: The meat sector in Sindh – key takeaways

- The livestock sector is an essential contributor to the socioeconomic development of Sindh, providing livelihoods, nutrition and economic benefits to the population. Notably, it provides substantial revenue to rural households engaged in subsistence livestock production.
- With approximately 25.3 million heads of bovines, Sindh has the second-largest herd of bovines in Pakistan after Punjab (27%). Sindh also holds about 25% of the national goat population and 16% of the sheep population.
- The veracity of estimates for livestock population and meat production are contested. Access to reliable and up-to-date livestock data at the provincial level is urgently needed for proper planning and the formulation, implementation and monitoring of any programme aimed at developing the sector.
- Meat production in Sindh is characterized by low carcass weight compared to other major international meat suppliers, significantly affecting export competitiveness.

The sector's structure, the animals' characteristics and how animals are being reared, aggregated and processed have a significant bearing on the meat industry's trade performance and a tremendous impact on its competitiveness.

Local meat exports are currently concentrated in the niche market of chilled carcasses in Gulf countries

A strategic and rapidly growing export sector driven by the chilled beef subsegment

Export revenues generated from international sales of beef and mutton have increased rapidly over the past decade and reached $310 million in 2021, doubling since 2012 (United Nations Comtrade).[6] The sector's exports are primarily dominated by the beef subsegment, which accounts for about 90% ($278 million) of the revenue generated in 2021. The remaining 10% (about $32 million) consist of exports of mutton (i.e. meat from small ruminants), in particular lamb (72%) (United Nations Comtrade). Beef exports have been particularly dynamic in recent years, with a robust CAGR of 12% between 2012 and 2021 (see Figure 1010).[7] These recent successes are primarily attributed to the private sector's dynamism in developing export market channels in GCC countries, where Pakistan benefits from a significant comparative advantage (see hereafter).

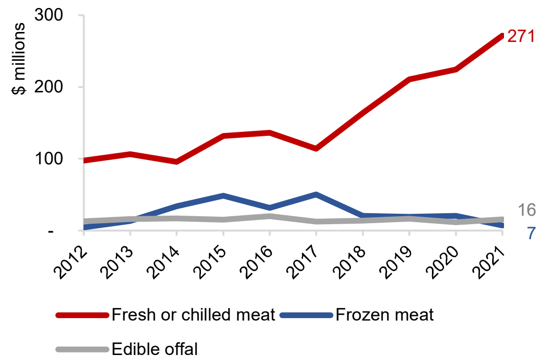
Mutton exports have been erratic over the past decade, suffering a progressive decline from 2012 to 2017. The surge in export earnings observed between 2018 and 2020 was short-lived and a sharp decline of 30% in export value was observed between 2020 and 2021 (see Figure 1111).

Despite this robust increase in export revenues, Pakistan remains a minor player in the international beef market. While Pakistan is a large meat producer – ranking 7th in bovine meat production in 2020 (FAOSTAT, www.fao.org/faostat/en/) – the country only ranks 25th based on the value of bovine meat exports, capturing a market share of about 0.5% in 2021 (0.9% if only considering the fresh or chilled market segment)

[6] The figures for meat exports are of red meat categorized under HS 0201 'Meat of bovine animals, fresh or chilled', HS 0202 'Meat of bovine animals, frozen' and HS 0204 'Meat of sheep or goats, fresh, chilled or frozen'. They do not include edible offal.
[7] Among the top 25 performers in 2020 based on products classified under HS 0201 'Meat of bovine animals, fresh or chilled' and HS 0202 'Meat of bovine animals, frozen'.

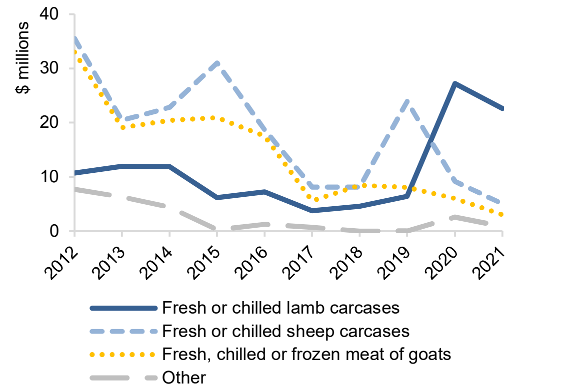
(United Nations Comtrade). Of the 2.3 million tons of cattle meat produced in Pakistan in 2020, only 3% were exported, or about 67,000 tons (FAOSTAT). By comparison, this ratio exceeded 15% in Brazil that same year.

Figure 10: Pakistan exports of meat and offal of bovine animals, 2012–2021 ($ millions)



***Source**:* ITC calculations based on United Nations Comtrade data.

Figure 11: Pakistan exports of meat of sheep or goats (HS0204), 2012–2021 ($ millions)



Source: ITC calculations based on United Nations Comtrade data.

Pakistan meat exports are primarily concentrated in the chilled carcasses market segment, and sold to GCC countries. Pakistan's primary exports of bovine meat are chilled products that have not gone through further processing, such as carcasses, half-carcasses and, to a lesser extent, cuts with bone in. In 2021, about 98% of Pakistan's total beef exports were in the fresh or chilled market segment, 85% of which consisted of carcasses or half-carcasses and the rest consisting mainly of chilled cuts with bone in.[8] In contrast, leading meat exporting countries, including Australia, Brazil and India, primarily export bovine meat in its frozen form. Similarly, mutton exports from Pakistan are largely concentrated in the fresh / chilled segment (at least 89% of total sheep and goat meat exports in 2021) and are mostly lamb carcasses (72%).[9]

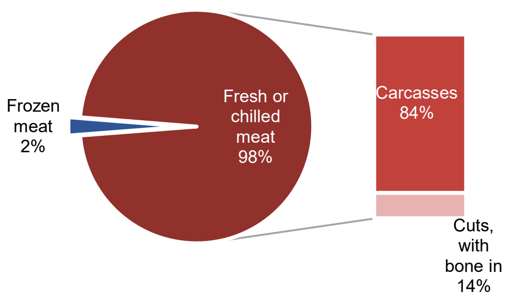
While Pakistan bovine meat processors have capitalized on this highly profitable niche market in GCC countries, this market segment is declining globally and only accounted for about 4% of global imports of bovine meat in 2021 (United Nations Comtrade).

Pakistan's meat exporters are not competitive in the frozen meat market segment. While most export-oriented processors have the capacity to process frozen meat, this category of products is currently largely underdeveloped due to limited market opportunities internationally and the incapacity to compete price-wise with Brazilian, Australian, Indian and American exporters of frozen meat. In 2021, Pakistan's exports of frozen bovine meat amounted to $6.9 million, its lowest level since the $4.4 million observed in 2012. As illustrated in Figure 1010, the export revenue generated from frozen bovine meat in Pakistan has been erratic over the past decade, with no clear upward trend. Exports of frozen goat and sheep meat are negligible, barely exceeding $400,000 in 2021 (United Nations Comtrade).

Pakistan also exported $15.6 million worth of edible offal in 2021, mostly in frozen form (88%), to Hong Kong (China) and Viet Nam. While significant opportunities exist in the export of prepared or preserved meat or offal of bovine animals, categorized under HS 160250, Pakistan has not yet managed to penetrate this promising niche market.

[8] Considering products classified under HS 0201 'Meat of bovine animals, fresh or chilled' and HS 0202 'Meat of bovine animals, frozen'.
[9] Export of goat meat categorized under HS 020450 does not allow classification by fresh, chilled or frozen meat.

Figure 12: Pakistan exports of bovine meat (HS0201 and HS0202), 2021 (% based on value)



***Source**:* ITC calculations based on United Nations Comtrade data.

Table 1: Pakistan's main red meat exports in 2021 ($ million and % based on value)

HS code	Product	Export value in 2021 ($ millions)	Share in Pakistan's red meat exports (%) *(HS 0201, HS 0202 and HS 0204)*
020110	Fresh carcasses of bovine animals	233.5	75.4
020120	Fresh or chilled bovine cuts, with bone in	37.5	12.1
020410	Fresh or chilled lamb carcasses	22.6	7.3
020421	Fresh or chilled sheep carcasses	5.0	1.6
020450	Fresh, chilled or frozen meat of goats	3.0	1.0
020210	Frozen bovine carcasses	2.9	0.9
020220	Frozen bovine cuts, with bone in	2.2	0.7
020230	Frozen boneless meat of bovine animals	1.7	0.6

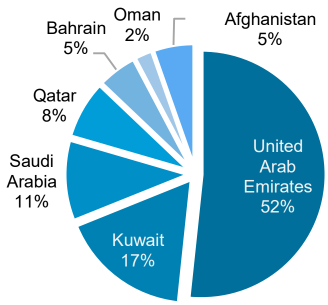
Limited access to international markets impedes Pakistan's export growth

Pakistan is currently categorized by the World Organization for Animal Health (OIE) as being at Stage 2 in the Progressive Control Pathway for FMD. Its locally processed bovine meat, therefore, only has limited access to most international markets. Only a few export destinations have recognized Pakistan's sanitary and veterinary measures through bilateral agreements and have allowed imports of Pakistani meat into their markets, chief among them the six GCC countries. The United Arab Emirates, Saudi Arabia, Qatar, Bahrain, Kuwait and Oman captured about 95% of Pakistan's fresh or chilled bovine meat exports in 2021, 52% of which were destined for the United Arab Emirates (United Nations Comtrade) (see Figure3). Pakistan's capacity to supply affordable chilled halal meat, which has a limited shelf life, within short delivery times and at relatively competitive transportation costs provides the country with a competitive edge in these markets. The remaining 5% of exports of fresh or chilled bovine cuts, with bone in, go to Afghanistan. The same observation can be made for the small ruminants subsegment as 99% of the $31.6 million worth of sheep or goat meat exported by Pakistan in 2021 was destined for the GCC market (United Nations Comtrade).

While several export-oriented slaughterhouses have recently been approved for meat exports to Jordan and Egypt, they are currently unable to significantly penetrate these markets due to minimum carcass weight requirements that are well above what Pakistan can produce.

This high concentration of exports in a limited number of products and markets leaves the meat industry exposed to product- and partner-specific shocks, including diplomatic tensions or strengthened quality control and quarantine systems.

Figure 13: Pakistan exports of fresh or chilled bovine meat (HS0201) in 2021, by destination



***Source**:* ITC calculations based on United Nations Comtrade data.

Box 4: Meat exports from Sindh – key takeaways

- The red meat sector, and the beef subsector in particular, is an important source of foreign exchange earnings through its exports, mainly to GCC countries. Pakistan exported $310 million worth of red meat in 2021 (HS 02, United Nations Comtrade data), about half of which is from Sindh.
- Bovine meat exports from Pakistan have been growing steadily in recent years, boosted by the sector's competitive advantage in the fresh carcass niche market in GCC countries.
- Export revenue generated by meat processors in Sindh comes almost exclusively from GCC countries, exposing exporters to exogenous economic and demand shocks in these countries.
- The fresh or chilled carcass market segment in which local processors currently operate is a declining market globally, accounting for less than 4% of world imports of bovine meat in 2021 (ITC calculations based on United Nations Comtrade data).
- The lack of indigenous beef breeds and the low average carcass weight do not allow local meat processors to capture international markets beyond the chilled meat markets of the GCC / Middle East.

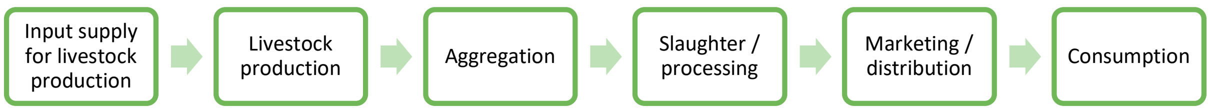
The transition towards a more diversified product mix with higher value added and destined for a larger number of international markets must be facilitated by addressing several bottlenecks and issues along the value chain.

Value chain analysis and competitiveness diagnostic

The value chain analysis outlines the operations of the meat industry in Sindh following a ‘from farm to fork’ approach. The analysis is used to investigate the meat sector’s competitiveness, identify bottlenecks and challenges, and define opportunities for strategic planning.

This section describes in detail the main stages in the value chain of Pakistan’s meat industry (see Figure 144).

Figure 14: Simplified meat industry value chain



Source: ITC.

A livestock production system dominated by rural smallholders

The livestock breeding and rearing systems that prevail in Sindh’s cattle production can be analysed through three different segments. Each production system has its specificities, requiring different value chain analyses.

1. **Rural subsistence production system**

Under the rural subsistence production system that prevails in Sindh, livestock is primarily reared by smallholders who keep an average of three to five animals, primarily to produce milk for the household. Consequently, livestock farmers prefer rearing heifers to male calves; the latter are generally considered a liability to the farmer and are sold and culled for meat at a young age. Cows and buffaloes too old to work in the fields or unable to produce milk or reproduce also enter the food chain.

This production system largely relies on traditional farming practices with little awareness and limited knowledge about good husbandry practices, animal health and nutritional requirements. Animals are primarily fed on grown fodders, and holdings have limited access to veterinary services and AI.

Rural subsistence smallholdings constitute by far the largest production system in Sindh. Though largely outdated, the 2006 livestock census indicates that about 90% of reported households owned fewer than 10 bovine animals, and about 60% owned fewer than four animals.

2. **Rural market-oriented small and medium-sized farms**

This segment consists of holdings with an average of 11–50 animals, although only about 10% of reported households fell into this category (Pakistan Bureau of Statistics, 2006). These farms apply improved basic husbandry practices and management practices, primarily to produce tradable surplus milk. Most of these farmers also adopt appropriate breeding techniques, including AI.

Many of these small and medium-sized farms work with *arthis* – traditional commission agents or middlemen – who provide a range of services to rural farmers in exchange for a commission or fee on selling livestock or meat products. They provide immediate financing and liquidity to rural households at the time of purchase from the farmer (Pakistan Business Council, 2021, p.33).

3. **Peri-urban and urban commercial large-size farming**

The rapid and steady growth of the urban population in recent years has led to a rapid expansion of the peri-urban cattle population to supply urban consumers, particularly in Karachi and Hyderabad. These holdings are very small in number and keep up to 2,500 animals in their herds, mostly concentrated in the Landhi cattle colony in Karachi and the cattle colony of Hyderabad. Cattle colonies are indispensable suppliers of milk, meat and other dairy products to urban areas.

This system has developed effective market links, breeds the animals on modern lines, is better equipped to meet technological requirements and maintains a trained workforce, including veterinary staff, for immediate and appropriate care of the animals. This results in higher productivity of both milk and meat animals. However, due to higher management costs, only high-yielding animals are retained, while calves and dry females are sold, generally for slaughtering.

Breeding and commercial feedlot fattening for beef production are also present in rural and peri-urban areas. Primarily, young calves under one year of age are bred or purchased, and the lot is sold to meat processors and exporters after 3–4 months at the feedlot. These farms, which have been established by investors in recent years, apply improved husbandry and management practices. Overall, backgrounding methods and commercial large-scale breeding and feedlot fattening farms still need to be expanded in Sindh.

Production system for small ruminants

Goat farming in Sindh is widespread and popular. Rural farmers tend to prefer goats as an initial agricultural investment because capital costs and fodder requirements are relatively small and feeding requirements are mostly met through grazing. Goats are kept for milk and meat production, providing extra income for marginal and landless rural farmers. Goat farming is not carried out commercially, and most farming units are not operated efficiently due to poor knowledge of modern practices.

Small ruminants, including goats and sheep, are mostly maintained through a traditional production system whereby flocks of generally more than 100 animals move around all year in search of grazing land. Females are retained for flock replacement or enlargement, but males are mostly sold within one year.

Goats and sheep production systems can be categorized as follows:

- **Nomadic production:** Flocks of sheep and goats – mixed with other animals, such as camels, donkeys and poultry – move continuously in search of water and grazing land. This system, controlled by tribal customs with well-established migratory routes, is prevalent in Tharparkar District.
- **Transhumant production:** Seasonal availability of pastures (winter / summer) is used. In contrast to nomads, transhumant flock owners have a permanent base with well-established migratory routes. Animals depend on rainfall in rangelands and pasture capacity.
- **Sedentary production:** Production practice for sheep and goats in irrigated and rain-fed areas. Flock owners and herders are permanent settlers, and their flocks graze in nearby rangelands, wastelands, crop stubbles and tree looping.
- **Feedlot fattening:** Animals are reared and fattened for short periods with moderate to high input levels. These farms are mainly located in peri-urban areas.

Inputs along the value chain

Upstream activities of the meat value chain concern animal husbandry and the inputs needed to keep livestock. Inputs include productive animals (genetics), vaccine and veterinary medicines, feed, fodder seed, silage / hay, and farm machinery.

Animal types and genetics

Indigenous breeds are generally either milk breeds, that is, genetically developed for higher milk production, or dual-purpose breeds, meaning they are neither specialized for meat nor for milk production. The main cow breeds in Sindh are the Red Sindhi and the Thari, accounting for 38% and 23% of Sindh's total bovine population, respectively (Pakistan Bureau of Statistics, 2006). Driven by the development of commercial dairy farms, the population of nondescript and crossbred animals (mostly between local cows like red Sindhi and imported cows like Holstein Friesian and Jersey) has increased in recent years due to their higher milk production. Unlike other developed countries, Pakistan has yet to develop an indigenous beef breed.

Feed and fodder

Animal feed accounts for a significant portion of the total input costs in dairy farming, with estimates suggesting that up to 60% of the costs for cattle and 80% for buffaloes are related to feed. Small rural farmers often rely on green fodder for their livestock, including all crops cut and carried for feed. These farmers typically rely on crop residues and marginal lands for grazing as they are often landless and unable to grow fodder themselves. The high cost of silage and concentrates, coupled with seasonal shortages of green fodder, can make it difficult for small farms to access high-quality feed inputs. This challenges smallholders looking to raise healthy livestock and maintain profitable operations.

In contrast, rural commercial farmers can grow or purchase green fodder for their livestock. Some of these farms also use commercial feed to supplement their animals' diets. Increased access to high-quality feed can help support the health and productivity of the livestock and maintain the profitability of farming operations.

Peri-urban, large-scale livestock farms often supplement green fodder with concentrates, crop residues and other agro-industrial by-products in their animal feed. These farmers typically rely on their formulas for feed formulation, which usually do not include silage and hay. In contrast, large – mainly dairy – corporate farms may purchase fodder, silage and hay and have nutritionists who formulate feed formulas based on the nutritional requirements of their cows.

At the national level, most animal feed comes from fodders and crop residues; one third is from grazing on rangelands, wastelands, canal banks and roadsides, and the rest is from crops and their by-products (see Table 23).

Table 2: Availability of fodder in Pakistan, FY 2020/21

Fodder	Availability (%)
Green fodder and crop residues	51
Forage grazing	38
Post-harvest grazing	3
Concentrates from crop residues	2
By-products (molasses, sugarcane tops, vegetables)	6
Total	**100**

Source: Pakistan Ministry of Finance (2021).

Despite being the primary and cheapest source of feed, fodder crops barely meet half of the maintenance requirements of the present livestock population. The supply is disrupted by critical fodder scarcity periods in winter (November–January) and summer (May–June). Further worsening the situation is the decrease of harvested fodder area by about 2% per decade.

Breeding and veterinary services

Indigenous breeds are typically milk breeds or dual-purpose breeds. While AI effectively increases the number of high-yielding breeds for meat production, this practice is not widespread and is mainly accessible to large commercial farms. Generally, only peri-urban, market-oriented farmers use veterinary and breeding services due to fragmented rural production systems, low levels of education among rural farmers and high costs that are often too expensive for smallholders. Historically, peri-urban farmers have not been involved in breeding buffaloes. Instead, they sell dry buffaloes to butchers or send them to rural areas, resulting in a significant loss of genetic resources.

Livestock aggregation

Arthis facilitate the aggregation process and play a key role in financing the purchase of animals from rural areas and transporting them to designated open livestock markets, the *mandis*. In Sindh, *mandis* are usually held once a week or once a month. Since these *mandis* are makeshift markets, their infrastructure, management systems and resources are minimal. Essential information about the animals – such as weight, breed, vaccination record, medical history and reproduction record – are unavailable to the buyer.

Buying and selling livestock takes place on an 'as is' basis, meaning the buyer visually inspects the animal, guestimates its weight and negotiates a price with the owner. As this operation requires specialized skill, most meat processors and exporters hire a *beopari* who buys live animals at the *mandis* on behalf of slaughterhouses and/or meat processors for compensation. Live animals sold in the *mandis* are transported to urban centres for slaughter.

Meat processing and marketing are done through two distinct channels

The meat exported by Animal Quarantine Department (AQD)-approved slaughterhouses mainly consists of fresh or chilled carcasses, as explained below.

1. ***Municipal abattoirs, private slaughterhouses and informal facilities, catering to domestic needs***

Most of the meat production in Pakistan is destined for the domestic market. According to Food and Agriculture Organization of the United Nations (FAO) statistics for 2020, over 97% of the 2.3 million tons of bovine meat produced in Pakistan was consumed domestically.

Sindh has 85 registered municipal slaughterhouses catering to domestic market needs. As per the Local Government Ordinance 2001, local governments (i.e. a *taluka / tehsil* municipal administration or town municipal administration) provide, manage, operate and maintain municipal slaughterhouses in Sindh (and issue licences to private slaughterhouses). The hygiene, technology and cold chain protocols of these municipal slaughterhouses could be improved to enhance the safety and quality of the meat produced. The meat from livestock slaughtered at government-approved slaughterhouses or private abattoirs for the domestic market is then transported to the wholesale meat market, where it is sorted and processed. Wholesalers purchase meat in bulk from the market and sell it to smaller retailers, restaurants and consumers, mainly at informal wet markets. The meat is consumed on the day of slaughter and is generally not refrigerated, except in selected butcheries in the major cities.

In the domestic market, a large share of the livestock is also culled at slaughter slabs, slaughterhouses and abattoirs that are not government-approved. Most of these facilities lack basic equipment, such as hoisting facilities, a lighting system and a regular water supply. The standard of hygiene and liquid and solid waste disposal are also poorly managed. The meat is mainly sold directly from the slaughterhouses and abattoirs to local butchers and retailed to consumers at informal wet markets. This meat is also for consumption on the day of slaughter and is generally not refrigerated. It has been reported that only 20% of animals are slaughtered in slaughterhouses, and 80% are slaughtered outside, that is, in open areas or the streets.

2. ***Export-oriented slaughterhouses***

In Sindh, 10 export-oriented slaughterhouses are registered with – and approved by – the AQD, all in Karachi (AQD, n.d.; Pakistan Ministry of Finance, 2020, Chapter 2). Live animals are brought from the *mandis* – from Sindh and other provinces – to these facilities where they are culled within a few hours after their arrival. A few export-oriented meat processors in Karachi have also developed feedlot fattening facilities for the partial supply of livestock. This not only presents an integrated supply approach but also ensures their animals are traceable. The slaughtered animals are examined ante-mortem and post-mortem by a designated veterinary officer. The meat from these AQD-approved slaughterhouses is then exported, mainly as fresh, chilled carcasses. Traditionally, Pakistan's exports of chilled carcasses to GCC countries are shipped by air, although they are now increasingly shipped via sea, which is cheaper. Some of these slaughterhouses also possess advanced vacuum packaging technology, capable of preparing and packing value-added chilled products with longer shelf life.

Several of these privately owned entities are state-of-the-art production facilities equipped with modern processing technologies, and conform to international standards of meat production, as certified by independent third parties (AQD, n.d.). However, due to the shortage of livestock reared for meat production and the restricted access to global markets for Pakistani meat (see hereafter), these facilities are not operating at full capacity, possibly as low as 20% of their potential.

The domestic and export markets are disconnected. It is virtually impossible for export-oriented slaughterhouses to compete on a level playing field with domestic wet markets, which benefit from unregulated practices, a weak and outdated regulatory framework, and low or no hygiene compliance costs. Consequently, the export-oriented slaughterhouses cater exclusively to the needs of international markets.

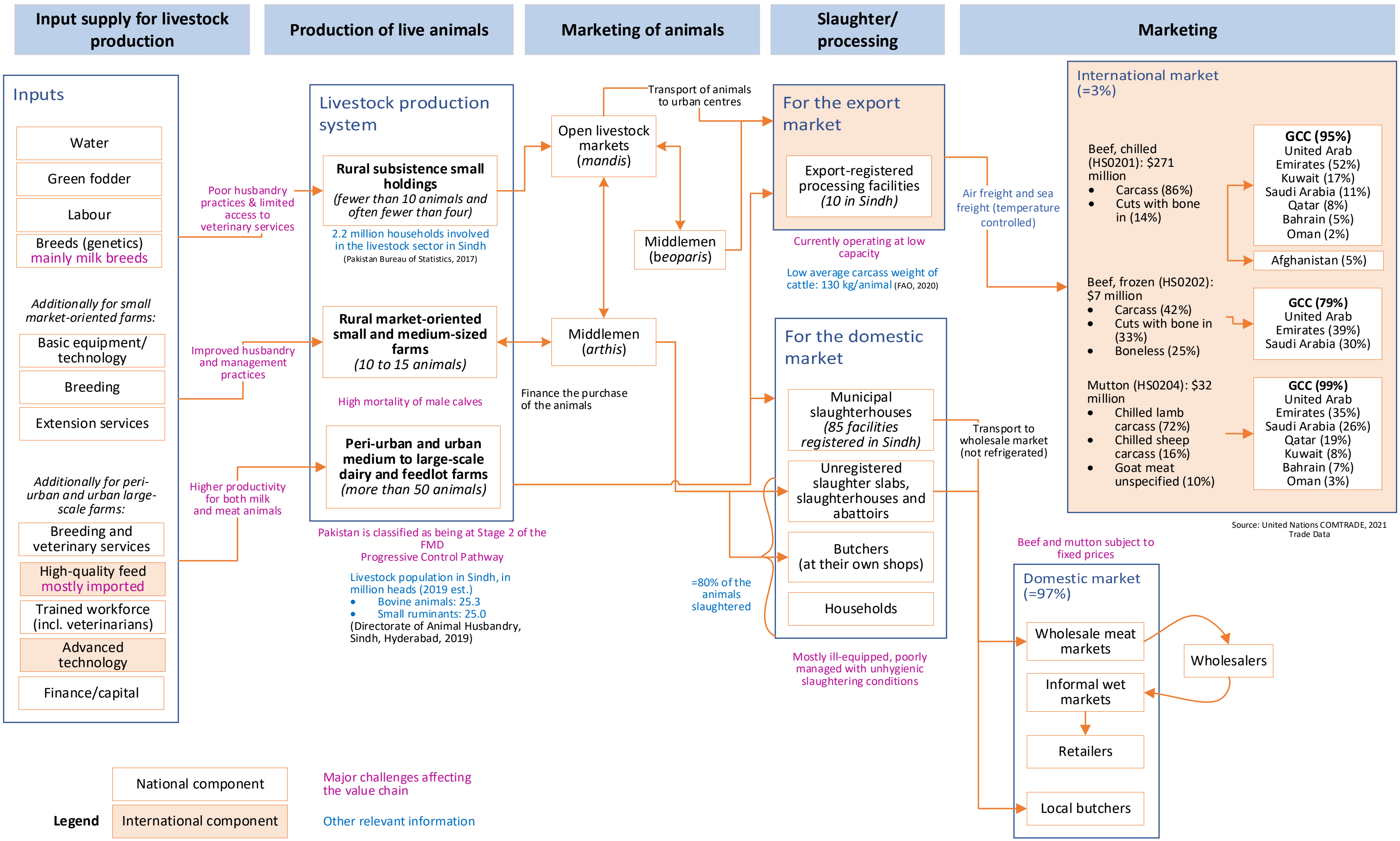
Value chain mapping

A value chain map is simply a visual representation of all the transformation processes and supporting services required to move a product or service from conception to delivery to the final consumer. It :

- Is a visual representation of the processes required to bring a product to market
- Creates a common understanding of the sector structure and how it operates
- Identifies the various stakeholders participating in sector production and their performance
- Provides a tool to analyse where performance gaps occur and where improvements to the sector could be undertaken.

The value chain for the meat sector in Sindh is presented in Figure 15.

Figure 15: The value chain



Source: ITC

Institutional and policy support ecosystem

The success of the meat sector in Sindh will depend not only on the internal capacities of the companies operating in the industry but also on the involvement of various ministries, public institutions and technical agencies. For the sector to achieve long-term, sustainable growth, participating enterprises must be able to rely on a capable network of government and private sector support institutions. This Strategy looks at the aggregate institutional framework in the country to identify the overall trade support network of the meat industry in Sindh. In doing so, it brings together institutions with a particular interest in, or bearing on, the sector's export development and competitiveness. These institutions or agencies support and promote the sector by providing government and enterprises with a wide range of trade-related services, including:

- Policy support (ministries, government agencies, etc.)
- Trade services (quality management bodies, chambers of commerce, etc.)
- Business services (professional associations, groups, etc.)
- Educational services and civil society network (universities, research institutes, laboratories, non-governmental organizations, etc.)

Key support institutions are presented in Table 4, categorized by level of importance for the sector and capacity to fulfil mandates related to the meat sector. The categorization is based on observations by ITC analysts and the sector core team. A more extensive list of trade support institutions involved in the development of the sector and their functions along the value chain is presented in Annex 4: Trade and investment support institutions involved in the development of the red meat sector in Sindh.

Specific capacity and resource issues must be addressed if these institutions are to support the industry effectively. Several interventions aimed at strengthening the sector's institutional capacity are addressed in the Strategy's PoA, including:

- Establish the LDC, comprising three dairy, meat and leather subcommittees in the form of public–private dialogue platforms to guide sector development. **PoA activity 1.1.6.**
- Establish a specialized food testing laboratory at the Sindh Food Authority (SFA). **PoA activity 1.3.1.**
- Build the capacity of technicians in food testing laboratories to undertake microbiological analysis and provide certified meat testing services. **PoA activity 1.3.2.**
- Introduce a scheme to provide mobile food testing labs and mobile units for food testing to private operators, with oversight control mechanisms from GoS. **PoA activity 1.3.3.**
- Build the capacity of food inspection services and appoint / recruit veterinarians and meat / dairy technologists. **PoA activity 1.3.4.**
- Undertake continuous skill and competency development in breeding practices and technologies, including AI technology and embryo transfer technology. **PoA activity 2.2.5.**
- Establish an Autonomous Epidemiology and Infectious Disease Control Authority to monitor for outbreaks of infectious diseases and be responsible for the supply of animal-related vaccinations and medicines, to shorten the reaction time in case of outbreaks. **PoA activity 3.1.3.**
- Establish and operationalize a national meat processors-cum-exporters association (with provincial branches) to defend the interests of private operators. **PoA activity 3.3.4.**
- Create a coordination council to develop market links between corporate meat processors-cum-exporters and progressive individual farmers and farmers groups. **PoA activity 3.3.5.**

Table 3: Influence versus capacities of trade and investment support institutions

		Capacity of the institution to respond to the needs of the meat sector	
		High	**Low**
Capacity to influence the meat sector	**High**	**Federal agency** • Ministry of Commerce • National Veterinary Laboratory • Pakistan Standards and Quality Control Authority (PSQCA) • State Bank of Pakistan • Trade Development Authority of Pakistan (TDAP) **Provincial agency** • Planning and Development Department (PDD) • Finance Department • Shaheed Benazir Bhutto University of Veterinary & Animal Sciences (SBBUVAS) • Sindh Agriculture University (SAU) • Sindh Board of Investment • Sindh Enterprise Development Fund **Private sector agency** • Dairy and Cattle Farmers Association (DCFA) • Pakistan Dairy Association (PDA)	**Provincial agency** • DoLF • Local government bodies • SFA • Sindh Environmental Protection Agency (SEPA) • Sindh Institute of Animal Health (SIAH) **Private sector agency** • All Pakistan Meat Exporters and Processor Association
	Low	**Federal agency** • Pakistan Agricultural Research Council • Pakistan Council of Scientific and Industrial Research (PCSIR) • Small and Medium Enterprise Development Authority **Provincial agency** • Department of Industries and Commerce • Karachi Port Trust	**Provincial agency** • Department of Agriculture, Supply and Prices (DoASP) • Health Department **Private sector agency** • Karachi Chamber of Commerce and Industry • Hyderabad Chamber of Commerce and Industry • Federation of Pakistan Chambers of Commerce and Industry • Breeder associations

Source: ITC analysts and the sector core team.

Box 5: Implications of influence versus capacities of the main trade and investment support institutions

The high or low capacity and influence of the institutions in the meat sector can impact the implementation of the Strategy and constrain policymaking and, subsequently, sectoral development. Institutions with higher capacity and influence generally have greater potential to drive positive change and address sector-specific challenges effectively.

High capacity and high influence: Institutions with high capacity and high influence have the resources, expertise and authority to effectively respond to the needs of the sector. As a result, such institutions can:

- Efficiently formulate and implement policies and reforms
- Address regulatory challenges, facilitate trade and provide financial support to the industry
- Adhere to the regulations for environmental sustainability, minimizing negative impacts
- Coordinate and support implementation with various stakeholders.

Low capacity and high influence: Institutions with low capacity but high influence may face a significant disconnect between the potential to influence and the ability to effectively address the sector's needs. Although these institutions have a high influence over the sector's development, their limited resources hinder their ability to effectively respond to the sector's specific requirements and challenges. This disconnect could result in missed opportunities to meet the sector's requirements, implement necessary reforms and provide adequate support for its growth and development. Such a disconnect highlights the need to strengthen the institutional capacity to better respond to the needs of the meat sector and bridge the gap between influence and effective action.

High capacity and low influence: Institutions with high capacity but low influence may face limitations in their ability to directly shape the overall development and direction of the meat sector. While they can provide support and assistance to address immediate needs, their ability to enact broader changes or policies driving the sector's growth and competitiveness may be constrained.

The regulatory framework

Many laws and regulations regulate the meat industry in Sindh, covering animal safety, feed, breeding, health and slaughter, sale of meat and human food safety, and include regulations enforcing shariah.

As per the Eighteenth Amendment of the Constitution of Pakistan, the provincial government is responsible for policymaking, planning, development and governance of the agriculture sector. However, the Sindh livestock sector is governed by a complex legal framework and multiple authorities. As a result, there is uncertainty about the sector's position in the regulatory landscape and confusion about the laws that apply; and the sector's management lacks coordination and cohesion.

Against this backdrop, the Sindh Livestock Sector Policy emphasizes the need for comprehensive policy interventions that involve all stakeholders, including public–private partnerships (PPPs) and value chain actors across all subsectors. A pragmatic policy regime must be created and regulatory and policy frameworks enabled that are investment-friendly and supportive of entrepreneurship. Several institutional adjustments are presented in the Way Forward section of this Strategy.

Table 5 presents the most impactful laws and regulations that apply to the meat sector in Sindh. A non-exhaustive list of laws and regulations applicable to the meat sector in Sindh is provided in Annex 2: List of laws and regulations applicable to the meat sector in Sindh.

Table 4: Government policy interventions in the sector

Name of the law / regulation	Objective / aims	Impact on the sector
The Sindh Animals Slaughter Control (Amendment) Act, 2004	Regulates the slaughter of animals for human consumption in Sindh and provides for the establishment and licensing of slaughterhouses, the humane treatment of animals during slaughter, and the inspection of slaughterhouses by the authorities to ensure compliance with the law.	Sets restrictions on the slaughter of animals. Prohibits the slaughter of useful animals and regulates the slaughter of other animals.[10]
Sindh Meat Control Act, 1978 and associated by-laws: • **By-laws for Regulation of Public Slaughterhouses, 1980** • **By-laws for Licensing Slaughtering of Animals, 1981**	Provides for the regulation and control of the slaughter, transport, storage and sale of meat in Sindh. The law also establishes a system of licensing and inspection for slaughterhouses and meat shops, and regulates the standards for meat hygiene and sanitation.	An essential piece of legislation that ensures that the meat and meat products sold in Sindh are high-quality and safe for consumption.
The Karachi Cattle Slaughter Control Act, 1950, and The Karachi Cattle Slaughter Control Rules, 1953, enacted under the Act.	Provides a legal framework for regulating the slaughter of cattle in Karachi, Pakistan, and ensuring that it is done in a humane and controlled manner. The rules specify the conditions under which cattle can be slaughtered, the procedures for obtaining permits for slaughterhouses,	Regulates the slaughter of cattle in Karachi, where all export-oriented meat processors are located.

[10] 'Useful animals' means: i) a female sheep below the age of one year and six months; ii) a female sheep of the age exceeding one year and six months but not exceeding four years, which is pregnant or fit for breeding purposes; iii) any female animal, other than sheep, below three years of age; iv) any female animal, other than sheep, which is pregnant or in milk or fit for breeding purposes; v) any female animal, other than sheep, between three and ten years of age, which is fit for draught purposes.

	and the responsibilities of the authorities for the inspection and monitoring of the slaughterhouses.	
The Sindh Cattle (Restriction of Slaughter) Act, 1950	Prohibits the slaughter of certain classes of cattle, including cows, calves and female buffaloes; and restricts the slaughter of male buffaloes over a certain age, except under specific circumstances. The law also regulates the transportation and sale of cattle to prevent the illegal slaughter of animals.	Regulates the slaughter of cattle in Sindh and prevents the slaughter of cows, calves and other useful cattle breeds.
The Sindh Local Government Act, 2013	Provides for the implementation of a code of conduct for butchers and slaughterhouses by the *Taluka* / *Tehsil* Municipal Administration / Town Municipal Administration. According to this Act, local governments are required to provide and maintain slaughterhouses and issue licences to private slaughterhouses. These laws empower the district government to make by-laws for working days and hours, design slaughterhouses, detail sanitary conditions and stalling of animals, dispose of diseased animals, etc.	As per the Act, local governments are responsible for providing, managing, operating and maintaining public-sector slaughterhouses.
The Sindh Livestock Breeding Act, 2016	Provides for the establishment of livestock breeding and genetic improvement centres and for the improvement of animal breeds to promote livestock production in Sindh.	The law provides for the development of infrastructure for livestock breeding, including breeding farms, veterinary research centres and training institutions.
The Sindh Livestock Registration and Trade Authority Act, 2017	Provides for the establishment of the Sindh Livestock Registration and Trade Authority for livestock registration, tagging and identification, and the development of activities related to livestock products, and the trade and export thereof in Sindh. Establishes a system of animal registration and identification with a traceability framework based on international standards. The Act is yet to be implemented.	Ensures the quality of animals and animal products to enhance the trade, marketability and market value of animals and animal products.
The Sindh Animal Disease Control Act, 2022	Provides for the control and prevention of the spread of contagious animal diseases. This newly passed Act provides for the establishment of a Sindh Animal Disease Control Authority, which is responsible for implementing and enforcing the provisions of the Act.	Provides for the control, prevention and eradication of animal diseases in Sindh.
The Sindh Food Authority Act, 2016	Establishes the SFA as a regulatory body responsible for ensuring the safety and quality of food products in Sindh.	The Act empowers the SFA to regulate and monitor the production, processing, packaging, labelling, import, export, storage and distribution of food products, including meat products.
Sindh Environmental Protection Act, 2014	Establishes SEPA and provides for the conservation, protection, rehabilitation and improvement of the environment in Sindh.	The measures put in place to regulate and monitor industrial pollution have implications for meat-processing plants and slaughterhouses. Such facilities need to comply with the regulations and standards set out in the Act, and failure to do so could result in fines or other penalties.

Source: ITC.

Key issues affecting the competitiveness of the meat sector in Sindh

The value chain analysis above outlines the operations of the meat industry in Sindh and provides an overview of the constraints faced by stakeholders at each stage in the chain. To remain realistic and resource-efficient, this Strategy cannot focus on all the issues affecting the value chain; instead, an informed selection of the most critical issues was made. The relative importance of each issue was assessed against the level of disturbance (as perceived by the stakeholders) and the ease of resolution (both in terms of cost and time involved). The most pressing issues are presented in this section.

The growth of the red meat industry is hindered by multiple factors that need to be addressed for it to become more inclusive and competitive. To achieve this, it is crucial to identify and prioritize these limitations, which affect the capacities of meat processors, the quality of the business environment and market entry. Additionally, the red meat sector – and the livestock sector as a whole – has an important socioeconomic bearing in Sindh because it can create new opportunities and additional revenue for the youth and women primarily involved in animal rearing. Given the recent floods in the country and its vulnerability to the effects of climate change, the government is also concerned with preserving its natural resources, ensuring environmental sustainability and building resilient supply chains.

The following section describes the key issues challenging the performance of the Sindh meat sector. Listed below each major constraint are the root causes that impede sector performance.

Table 5: Supply-side constraints

Main challenges	Root causes	PoA references
The profitability of livestock farming is hindered by the limited adoption of good husbandry practices and little commercial farming for meat production	Limited adoption of good husbandry practices for animal production	2.3.4.
	High mortality rate of suckling calves with little to no practice of backgrounding male beef calves, generally culled at a young age	2.3.1., 2.3.2., 2.3.3.
	Absence of large-scale feedlots and fattening farms dedicated to meat production, with limited education and awareness about these methods	3.2.1.
Indigenous cattle breeds are not well suited for meat production, resulting in low average carcass weight	Prevalence of low-yield indigenous milk breeds that do not gain sufficient weight for optimal meat production	2.2.2., 2.2.3., 2.2.4.
	Limited research and development (R&D) to optimize livestock potential and further improve the genetics of native breeds for meat production (the focus of cross-breeding programmes has so far been on milk breeds for the dairy industry)	2.2.1.
	Improper and limited breeding services with insufficient AI facilities in Sindh	2.2.5., 2.2.6.
High cost and limited availability of animal feed and fodder, the primary determinant of animal productivity and production costs	Shortage of fodder production with important seasonal shortages, limiting livestock production	2.1.1., 2.1.2., 2.1.4.
	Unavailability of grass and fodder with high protein content, with limited R&D in the field	2.1.5., 2.1.6.
	Poor and low-yield animal feed, with an underdeveloped animal feed industry	2.1.3.
	Limited knowledge and skills in the selection of fodder type and seeds and in appropriate cultivation and preservation practices	2.1.7.

The profitability of livestock farming is hindered by the limited adoption of good husbandry practices and little commercial farming for meat production. Traditional rural subsistence production systems often neglect crucial practices such as animal nutrition and health, leading to low animal yields, high production costs and inconsistent levels of beef production. Furthermore, livestock farmers often prioritize dairy production over meat and only sell animals for meat when they are no longer productive in other areas. This approach, combined with the absence of backgrounding and large-scale feeding facilities, such as feedlots and fattening farms dedicated to meat production, limits the number of animals available for slaughter and increases livestock costs. There is also limited education and awareness about these methods, resulting in a shortage of animals reared for meat production.

The prevalence of low-yield milk breeds with a poor feed conversion ratio contributes to the low average carcass weight of cattle in Sindh. Sindh is yet to develop an indigenous beef breed because cross-breeding programmes have primarily focused on milk breeds for the dairy industry, which do not gain sufficient weight for optimal meat production. Moreover, the lack of advanced technology transfers and overall R&D, which is partly due to limited skills among professionals and farmers, has limited the optimization of existing cattle, goat and sheep stock genetics. Inadequate AI infrastructure is also a significant impediment to improving breeding services. Additionally, there is a general lack of technical skills and awareness regarding the breeding process and its benefits.

The limited availability of fodder and quality feed results in suboptimal animal nutrition and low animal yield. Inadequate fodder production with low protein content and severe seasonal shortages results in suboptimal animal nutrition and relatively low carcass weight for meat production. Limited knowledge and skills in the selection of fodder type and seeds and in appropriate cultivation and preservation practices further exacerbate the issue. Another issue is that farmers generally do not produce their seeds and instead use poor-quality, uncertified seeds that produce poor forage yield. In addition, the locally formulated feed industry, which is underdeveloped and has only limited outreach in rural areas, relies on imports of animal feed and high-nutritive ingredients that are expensive due to high import duties. As a result, quality feed in Sindh is costly and only affordable for large farms.

Limited resources and supply systems for animal nutrition currently prevent small farmers from keeping high-producing animals as they cannot afford the nutritional requirements. These farmers may struggle to maintain healthy and productive livestock, ultimately impacting the productivity and profitability of their farming operations.

Table 6: Business environment constraints

Main challenges	Root causes	PoA references
The regulatory landscape is not conducive to private sector development	The regulatory framework lacks clarity and a multitude of laws currently apply to the livestock sector, particularly in the context of the Eighteenth Amendment of the Constitution of Pakistan	1.1.1., 1.1.2.
	Concerns exist regarding the inefficient management and maintenance of public slaughterhouses that are currently the responsibility of local governments	1.1.3., 1.1.4.
	Beef and mutton are subject to prices fixed by district officers, which prevents the private investment needed to fully realize the tremendous growth potential of the meat sector in domestic markets	1.1.5.
Lack of animal census and reliable livestock data	The veracity of the available data on livestock population and meat production is unconfirmed and contested because it is based on a static growth rate applied to the numbers reported in the 2006 livestock census	1.2.1.
	There is a lack of harmonized and standardized data collection and compilation techniques across the different departments involved in livestock data monitoring in Sindh	1.2.2.
Overall poor quality and food safety management in the domestic market	Except for export-oriented processing companies, most of the private-sector and government-run abattoirs catering to the domestic market are ill-equipped, poorly managed and characterized by unhygienic slaughtering conditions	1.1.3., 1.1.4., 3.2.2., 3.2.3.
	Meat industry regulations and standards are outdated and do not cover the whole production chain	1.3.5.
	Food safety control and inspection services are insufficient	1.3.1., 1.3.2., 1.3.3., 1.3.4.

The regulatory landscape is not conducive to private sector development. The fragmented and complex regulatory landscape challenges coordination, collaboration and enforcement in the livestock sector and therefore hinders its growth and development. Under the Eighteenth Amendment of the Constitution of Pakistan, passed in 2010, many powers and responsibilities related to agriculture and livestock were devolved from the federal government to the provinces. Accordingly, the GoS became responsible for the planning, development and management of the livestock sector. However, the devolution of powers and responsibilities has also resulted in a fragmented and complex regulatory landscape for the livestock sector. There is a lack of clarity regarding the applicable laws and institutional mandates and responsibilities in Sindh's livestock sector. This is due to the multiple authorities, including provincial and district governments, and various regulatory bodies responsible for the sector. As a result, enforcement of the legislative and regulatory framework has been weak.

The lack of animal census and reliable livestock data does not allow for effective policymaking, market analysis, and monitoring and evaluation in the livestock sector. As indicated earlier, the veracity of the available data on livestock population and meat production in Sindh is unconfirmed and contested because figures are based on a static growth rate applied to the numbers reported in the 2006 livestock census and calculated using the inter-census growth rate from the 1996 and 2006 livestock censuses. Access to current and reliable livestock data is essential for effective planning, policymaking and resource allocation within the sector. It helps policymakers design and implement evidence-based policies and programmes that address the specific needs of different subsectors and regions, and track progress against targets and indicators. Reliable empirical data is also critical for market analysis because it helps producers, traders and policymakers understand market dynamics, demand patterns and consumer preferences. Such knowledge can then inform pricing strategies, market entry decisions and export policies.

Overall poor quality and food safety management in the domestic market. The lack of basic hygiene and food safety applications in local government-run slaughterhouses and abattoirs is a major concern for public health. Most private-sector and government-run abattoirs catering to the local market are poorly managed and characterized by unhygienic slaughtering conditions. In addition, the number of abattoirs equipped with proper machinery and equipment is limited, and there is a lack of adequate pre-slaughter handling. Municipal slaughterhouses also lack cold chain systems and protocols for storage and transportation from slaughter to market. Furthermore, a significant lack of food safety control and inspections puts consumers at risk. These issues must be urgently addressed to ensure the safety and quality of meat products for all consumers.

Table 7: Market entry constraints

Main challenges	Root causes	PoA references
The prevalence of TADs – in particular FMD, lumpy skin disease and *peste des petits ruminants* – results in significant financial loss and constitutes a major hindrance to entering export markets	Absence of a clear and comprehensive TAD control and eradication strategy and the lack of disease-free compartments and zones	3.1.2.
	Unavailability of data and monitoring regarding outbreaks of infectious diseases	3.1.3., 3.1.4.
	Lack of traceability of livestock, making it difficult to control the spread of disease	3.1.6., 3.1.7.
	Insufficient supply of quality vaccines for TADs and lack of control of imported vaccines	3.1.1., 3.2.5.
The lack of an animal traceability mechanism is a major barrier to exporting meat products to developed countries	Lack of traceability of animals (no animal sales records and no history of animals, including birth, vaccination and genetics) due to a largely informal and undocumented meat value chain	3.1.6., 3.1.7.
	Lack of available information regarding livestock populations and their movement at the provincial level	3.1.7.
The domestic market for bovine meat is unattractive to export-oriented meat processors	The high costs of complying with quality requirements, imposed by international clients, prevent export-oriented meat processors from competing fairly and equally with unregistered domestic operators who do not apply food safety standards	1.3.5.
	The price control regime fixes meat prices in the domestic market, distorting competition and discouraging investment	1.1.5.
Access to market information is inadequate	Inadequate information on export-quality management	3.3.3.
	Lack of easily accessible and updated information on market access requirements in existing and potential partner countries for the meat and meat products processed in Sindh	

The presence of TADs – specifically FMD,* peste des petits ruminants *and lumpy skin disease – results in significant financial loss and is a major barrier to entering export markets. There neither is a comprehensive control and eradication programme for TADs in Sindh nor have any disease-free zones or compartments been established. Sindh also has limited diagnostic facilities for diseases, especially in rural areas, due to the lack of well-equipped and adequately staffed diagnostic laboratories. Additionally, there are no proper monitoring and surveillance mechanisms, which contributes to the lack of data regarding outbreaks of infectious diseases.

Further aggravating the matter is the insufficient supply of quality vaccines and veterinary medicines for TADs. This significantly hinders the growth of Sindh's livestock sector. Both the lack of mass vaccination programmes and the ineffectiveness and limited availability of locally produced vaccines means farmers in the region are reliant on expensive imported vaccines that are often suboptimal and unaffordable for most farmers. To date, it is estimated that the total vaccine production from the Veterinary Research Institute only covers 15% of Sindh's livestock population. Consequently, disease outbreaks are a major problem.

The lack of animal traceability mechanisms in Sindh's meat value chain is a challenge for producing and marketing livestock, controlling and preventing disease, ensuring food safety and meeting export market requirements. Currently, the meat supply chain is mainly informal and undocumented, and does not allow for systematic animal traceability (no animal sales records and no history of animals, including birth, movement, vaccination and genetics). This makes it difficult to trace, control and prevent the spread of diseases. Traceability is important because it enables authorities and private businesses to trace food contamination to its source and recall all products with the same origin. Finally, a basic tagging system and animal registration systems are essential tools for verifying compliance with regulatory and quality standards and meeting the increasingly strict requirements of export markets.

The domestic market for bovine meat is unattractive to export-oriented meat processors. Informal practices at unregistered facilities are prevalent, creating an unfair playing field for registered, export-oriented processors. Export-oriented processors must comply with quality requirements imposed by international clients, which drives up their costs and makes it difficult to compete with unregistered domestic operators who do not apply food safety standards. In addition, the price control regime sets prices for beef and mutton in the domestic market, distorting competition and discouraging investment. This also hinders the growth of the formal meat retail trade, which could stimulate demand for value-added meat products. Furthermore, input prices have increased but meat prices remain fixed, leading to imbalanced pricing.

Access to market information is inadequate. Exporters of meat and meat products from Sindh often face difficulties in accessing up-to-date information on market access requirements in existing and potential partner countries. One way to improve access to market information is to establish a trade information portal providing exporters with access to information on market access requirements, tariff rates, quotas, sanitary and phytosanitary requirements, and other trade-related regulations. This would help exorters identify potential markets for their products and understand the specific requirements of those markets.

Table 8: Development goals

Main challenges	Root causes	PoA references
Adherence to environmental standards is limited and waste management in the sector is inadequate	Lack of comprehensive laws and regulations to promote cleaner production and ineffective enforcement of existing laws and regulations	1.1.1., 1.3.5.
	Poorly managed standard of hygiene and liquid and solid waste disposal in government-run slaughter facilities	3.2.2., 3.2.3.
	Lack of 'green' initiatives in the livestock sector, be it for the conversion of manure (biomass) to biogas or the use of renewable energy sources	3.2.6., 3.2.7.
Climate-smart interventions are required, including reducing greenhouse gas emissions	Lack of R&D to promote climate-smart feeding regimes generating fewer emissions	2.1.1., 2.1.4., 2.1.5.
	Lack of R&D to develop resistant, high-yielding breed variants adapted to the harsh local climatic conditions	2.2.2.
Gender inequality remains a significant issue in the livestock sector	Limited opportunities for women to participate in training on livestock management	2.3.4.
	Limited female representation among veterinary practitioners	Covered in the Dairy SDS, Sindh (Activity 1.1.4.)

Adherence to environmental standards is limited and waste management in the sector is inadequate. Although several laws and regulations help promote cleaner production in the sector, notably at the slaughterhouse level, they are not as effective or comprehensive as they could be. Insufficient coordination between responsible institutions is one factor, and inefficient provincial implementation is another. At the provincial level, there is limited capacity for supervisory bodies such as SEPA to monitor compliance with environmental protection laws and standards, mostly due to limited capacity in human resources and lack of skills.

Owing to this lack of capacity of supervisory bodies, most of the industry operates with limited adherence to the standards set under the Sindh Environmental Protection Act, 2014. Moreover, slaughters are not adequately controlled or monitored; most slaughterhouses, whether for the domestic or export markets, have poor wastewater and solid waste management systems; and effluent treatment is weakly regulated, regardless of existing environmental standards. The result is harmful discharges released into the surrounding environment.

Livestock production has a significant environmental impact. Some of the key environmental concerns associated with meat rearing include:

- Greenhouse gas emissions: Livestock production is a major contributor to greenhouse gas emissions, particularly methane and nitrous oxide. These gases have a higher global warming potential than carbon dioxide, contributing to climate change.
- Land use: Livestock farming requires vast amounts of land for grazing and growing animal feed. This leads to deforestation as forests are cleared to create more pastureland or to cultivate crops for animal feed.
- Water usage and pollution: Livestock farming requires substantial amounts of water for animal drinking, cleaning and crop irrigation. The intensive use of water resources can strain local water supplies. Moreover, livestock waste and the run-off from animal farms can pollute nearby water bodies, leading to water contamination.

To mitigate some of these environmental concerns, the Strategy supports the implementation of sustainable and responsible practices, such as reducing greenhouse gas emissions, for instance, through the production of climate-smart animal feed and fodder and the development of breeds adapted to the local climate. Recommendations for improving animal welfare, enhancing wastewater management, promoting sustainable pasture and rangeland management practices, and developing green energy sources have also been formulated.

Gender inequality remains a significant issue in the livestock sector in Sindh. Women in rural areas are often responsible for the daily management of livestock, including cattle, buffalo, goats and sheep. Women's involvement in livestock management is typically not recognized or valued, and they often lack access to resources such as veterinary services, training and credit. In Sindh, women's participation in the livestock sector is further limited by cultural and social norms, limiting their opportunities to participate in livestock markets and access information and training on livestock management. To address these issues, efforts should be made to promote gender equality in the livestock sector in Sindh; for example, through training and support services specifically for women.

The way forward: Strategic orientations and market opportunities

The preceding section of this document has delineated the sector's value chain and reviewed its overall positioning within the national and global industry context to confirm its current performance. The following section discusses the strategic development and positioning of the sector to increase its future performance. In doing so, it addresses two pertinent questions: 'Where do we want to go?' and 'How do we get there?'.

The answer to these questions will guide the implementation of the Strategy over the next five years. Given the ample supply of livestock, coupled with the projected growth in global demand for meat and meat products, the Sindh meat industry is well-placed to realize the vision formulated and agreed upon by the stakeholders who participated in the consultations for the design of the Meat SDS for Sindh.

'A sustainable, competitive and integrated meat sector in Sindh that thrives in an enabling business and regulatory environment'

The vision statement reflects stakeholder priorities centred around the safe and sustainable production of high-quality meat, with each stage of the process connected and coordinated. Realizing this vision will allow Sindh's meat sector to be competitive in international markets. Importantly, the industry also aspires to be private-sector-led by creating an enabling regulatory environment for businesses. The following strategic and operational objectives have been defined to achieve this vision and pursue the key value chain transformations required to unlock the industry's potential.

Figure 16: Strategic and operational objectives

Strategic objective 1 **Create an enabling environment for sustainable private-sector-led growth in the meat sector**	• 1.1. Streamline and simplify the institutional, legal and regulatory framework • 1.2. Ensure access to reliable livestock data • 1.3. Strengthen food safety and quality management in the meat sector
Strategic objective 2 **Improve the productivity and profitability of livestock production while building climate change resilience**	• 2.1. Promote climate-smart feed production for optimal animal nutrition • 2.2. Foster genetic improvement of local livestock breeds • 2.3. Reduce the mortality rate of male calves and implement improved practices across the entire value chain
Strategic objective 3 **Develop a sustainable, integrated and disease-free livestock supply chain and foster increased local value added**	• 3.1. Foster efficient management and control of TADs and improve livestock traceability • 3.2. Develop an integrated and sustainable meat industry with strong supply chains, logistics and green energy solutions. • 3.3. Increase local value added and strengthen market links

Structural adjustments to the industry

Institutional, legal and regulatory amendments

The objectives pursued by the amendments proposed in this section are twofold:

1. **Streamline and simplify the institutional, legal and regulatory framework given the devolution of power**

The devolution of powers and responsibilities has resulted in a fragmented and complex regulatory framework for the Sindh livestock sector, and uncertainty and confusion regarding applicable laws. Multiple authorities are responsible for the sector, including provincial and district governments and various regulatory bodies, adding to the complexity of the institutional landscape and its management, which lacks coordination and cohesion. This lack of clarity regarding institutional mandates and responsibilities has contributed to the weak enforcement of the legislative and regulatory framework in Sindh. Consequently, all legislation that applies to the livestock sector in Sindh should be reviewed, streamlined and harmonized, and institutional coordination and implementation mechanisms should be strengthened.

2. **Create an enabling environment for businesses that supports competitive production and export of livestock products**

Consistent with the Sindh Livestock Policy, the Meat SDS emphasizes the role of GoS as a regulator, focusing on developing a regulatory framework that is conducive to private sector development and supporting domestic and foreign investment. It is further recommended that the government let the private sector take the lead on the production side, with progressive disinvestment of government-owned production facilities. Therefore, the Strategy calls for the creation of a coherent, efficient and enabling policy and regulatory regime, being mindful that regulatory reforms and progressive disinvestment of government-owned production facilities are a long-term endeavour.

In particular, GoS shall take the following policy interventions:

- Declare 'meat' as a separate agricultural economic sector and advocate that all applicable oversights and controls in the **meat sector fall under the jurisdiction and management of GoS**, as per the Eighteenth Amendment. **PoA activity 1.1.1.**
- Through a consultative process, review, streamline and harmonize all legislation that applies to the livestock sector in Sindh and make the necessary amendments. Coordination and implementation mechanisms should also be strengthened. **PoA activity 1.1.2.**
- Amend the Sindh Local Government Act, 2013 to transfer the functions and powers to provide, manage, operate and maintain public-sector slaughterhouses from a corporation (metropolitan corporation, district municipal corporation or municipal corporation), a municipal committee or a town committee to GoS. **PoA activity 1.1.3.**
- Amend the Sindh Animals Slaughter Control (Amendment) Act, 2004 and declare DoLF the custodian and implementer of the Act rather than the Local Government Department. The responsibility for establishing and licensing slaughterhouses should be transferred to Sindh. **PoA activity 1.1.4.**
- Remove beef and mutton from the list of essential commodities as defined under the Sindh Essential Commodities Price Control and Prevention of Profiteering and Hoarding Act, 2005 so that these commodities will no longer be subject to price fixing by district officers, as stipulated under the Act. This will spur competition, and encourage product differentiation and value addition. **PoA activity 1.1.5.**
- Introduce basic requirements for meat hygiene, chilling, packaging and labelling operations in the domestic meat market. The regulations should include enforcement measures involving prohibitive monetary and criminal penalties. **PoA activity 1.1.5.**

In the context of the progressive disinvestment of government-owned production facilities by GoS, with increased roles and responsibilities for the private sector, creating and operationalizing a strong meat processor-cum-exporter association defending the interests of corporate operators is urgent. Among other missions, the association shall engage in public policy advocacy with and on behalf of its members. **PoA activity 3.3.4.**

Value chain options

The value chain must be transformed to unlock the potential of the meat industry in Sindh. Proposed options will integrate good practices, improve connections with dairy processors and increase sector organization and coordination. These adjustments will allow the sector to achieve sector sustainability, supply consistency, product quality and capacity to conform to export requirements.

Table 9: Value chain transformation to grow Sindh's meat sector

Value retention: Retain greater value by strengthening inputs into local production and reducing the mortality rate of male calves		
Value option	How to implement	PoA links
Improve animal health and nutrition	• Support the production of climate-smart feed locally and strengthen research into animal health and nutrition • Encourage the adoption of good husbandry practices and modern dairy farming techniques	Operational objective 2.1.

Optimize the genetic potential of animals for increased meat yields	• Develop better breeding practices and technologies, and support academic research in that field • Establish a laboratory for animal genetic mapping and genetic marker-assisted selection for livestock breeding • Support the creation and modernization of semen production units (SPUs), beef and mutton breeding farms, and embryo extraction units	Operational objective 2.2.
Reduce the mortality rate of male calves	• Buy male calves from farmers in rural areas for backgrounding / fattening in private meat processors-cum-exporters' facilities • Establish community-level centres for rearing and dealing in male calves • Implement a Sindh milk replacer programme	2.3.1. 2.3.2. 2.3.3.
Value acquisition: Acquire greater value by improving efficiency		
Value option	How to implement	PoA links
Develop feedlot farming for meat production	• Develop and publish PPP tenders for feedlot development and management in Sindh, including backgrounding for feedlots	3.2.1.
Upgrade livestock auction markets	• Upgrade livestock auction markets (*mandis*) to reduce the stress for animals and improve the quality of the meat	3.2.4.
Value added: Improve product quality, capitalizing on buyer requirements		
Value option	How to implement	PoA links
Develop animal disease-free zones and compartments	• Identify, notify and develop animal disease control zones and compartments in line with OIE guidelines • Establish vaccine and medication production lines	3.1.2. 2.3.1.
Improve livestock traceability	• Introduce a basic tagging system to identify and register animals through a compartmentalization approach • Support the development of a feedlot farm-to-slaughter tagging system	3.1.6. 3.1.7.
Ensure the production of safe meat and meat products for the domestic market	• Introduce basic requirements for meat hygiene, chilling, packaging and labelling operations in the domestic meat market	1.3.5.
Harmonize existing halal certification systems	• Create an independent and internationally accredited inspection and certification body for halal meat in Sindh	1.3.6.
Value creation: Create new products to increase market penetration		
Value option	How to implement	PoA links
Upgrade processing equipment and technology	• Assist operators in replacing or acquiring new technologies and equipment to expand their operations	3.3.1.
Increase the availability of skilled workers	• Train meat workers and professionals on product development, advanced packaging and value added of meat and meat products	3.3.2.
Improve intelligence on markets	• Establish an e-commerce portal providing timely information on beef and mutton in the international markets	3.3.3.
Improve the social development impact of the industry		
Value option	How to implement	PoA links
Promote gender equality and the empowerment of women	• Support the participation of women in training on livestock management and entrepreneurship	2.3.4.
Improve the environmental impact of the industry		
Value option	How to implement	PoA links
Promote green power generation systems	• Facilitate investment in solar and wind energy systems	3.2.7.
Promote the use of organic farmyard manure	• Introduce a scheme to develop the sector for manure energy and recycling-based, climate-smart organic fertilizers	3.2.6.
Reduce greenhouse gas emissions	• Support the production of climate-smart animal feed and fodder • Invest in developing breeds that are adapted to the local climate	2.1.1. 2.1.2. 2.2.2.
Reduce the impact on pastures and rangelands	• Promote sustainable pasture and rangeland management practices	2.1.7.

Investment opportunities

The development of better production capacity will require investment in key strategic areas of the meat value chain in Sindh. Consistent with the Sindh Livestock Policy, the Meat SDS promotes the gradual disinvestment of government-owned production facilities like slaughterhouses, vaccine production plants and SPUs by outsourcing to the private sector. There is great potential for private sector investment if GoS disinvests and provides an enabling environment based on policies that are investment-friendly and supportive of entrepreneurship. As stipulated in the Sindh Livestock Policy, the mobilization of private investment may be supported through land grant schemes, matching grants and tax relaxation regimes, among other means.

The following segments require focused investment to upgrade the value chain.

Table 10: Investment needs to upgrade meat sector value chain

Investment needs	Rationale
Attract investment in climate-smart feed production **PoA activities: 2.1.1. and 2.1.3.**	**Why?** Significant investments are required to stimulate the local production of feed and fodder to ensure a year-round supply of high-quality, nutritive feed and fodder, and improve animal nutrition in Sindh. Importantly, this would significantly reduce livestock production costs and contribute to increasing carcass weight. **How?** Mobilizing private sector investment through matching grants and technical assistance to private operators, with GoS playing an oversight and regulatory role **Source of funding:** Private
Create the conditions for private investment in SPUs and breeding services, including AI **PoA activities: 2.2.2. and 2.2.3.**	**Why?** It will be important to support the sustained supply of genetically improved calves for backgrounding through the development of high-yielding breed variants and advanced genetic improvement technologies (i.e. embryo transfer technology and AI). For improved efficiency, innovation and increased resources, SPUs and breeding services should be consistently outsourced to the private sector, following the provisions of the Sindh Livestock Policy for the government's gradual disinvestment. **How?** SPUs and breeding services could be operated through PPPs, with GoS playing an oversight and regulatory role. The functions and powers to manage, operate and maintain these services should be progressively transferred to private operators. Matching grants could also be provided to encourage private investment. **Source of funding:** Private
Incentivize the establishment of large-scale fattening farms and feedlots **PoA activity: 3.2.1.**	**Why?** Developing facilities where herds can be reared exclusively for backgrounding and fattening would allow the production of better-quality and disease-free meat with higher carcass weight. Using such facilities would reduce transaction costs – and reliance on middlemen – and ensure a consistent supply of quality live animals, allowing for economies of scale. Overall, this would increase the competitiveness of the Sindh meat sector. **How?** GoS could provide long-term land leases and basic facilities for long-term management by private operators. A pilot project in an animal disease control compartment could also be considered through a PPP model. **Source of funding:** Private
Build partnerships with private operators to produce vaccine and medication production lines **PoA activity: 2.3.1.**	**Why?** The large-scale production of vaccines and animal medication through the mobilization of private investment would improve the availability of vaccines and medicines adapted to local conditions and at reduced costs. Outsourcing these production lines to the private sector is also consistent with the provisions of the Sindh Livestock Policy for the government's gradual disinvestment. **How?** Production lines are to be established through a PPP joint venture model with a licence for special purpose vehicle (SPV) companies under Section 42 of the Companies Act, 2017 ('Licensing of associations with charitable and not-for-profit objects'), with long-term management control from the private sector. GoS would provide basic infrastructure, protocols and oversight. **Source of funding:** Private

Develop partnerships with private meat processors willing to invest in community-level male calf-rearing and -dealing centres **PoA activity: 2.3.2.**	**Why?** Calf-rearing and -dealing centres would provide farmers with access to processors-cum-exporters – and vice versa – for off-taking the calves. This would reduce the mortality rate of calves and improve the supply of young animals in the required quality and quantity. **How?** Centres are to be established through a PPP joint venture model with a licence for SPV companies under Section 42 of the Companies Act, 2017 and operated by private operators. GoS would provide basic infrastructure and play an oversight and regulatory role. **Source of funding:** Public and private
Outsource the management of government-run slaughter facilities and livestock markets to the private sector **PoA activity: 3.2.2.**	**Why?** Investment is required to modernize government-run slaughter facilities and equip them with cold storage and waste management for improved hygiene conditions and address concerns about food safety. For improved efficiency and increased resources, gradual disinvestment of government-owned slaughterhouses and outsourcing to the private sector should be supported, following the provisions of the Sindh Livestock Policy. **How?** Public slaughterhouses could be operated through PPPs, with GoS playing an oversight and regulatory role and arranging long-term management contracts with private operators. Outsourcing the management of these slaughterhouses would attract private investment. **Source of funding:** Private and public for initial investment
Hire private companies to develop and deploy livestock tagging systems, including software solutions for animal registration and identification **PoA activities: 3.1.6. and 3.1.7.**	**Why?** Animal traceability is essential to trace, control and prevent the spread of diseases. In cases of food contamination, it enables authorities and private businesses to trace the contamination to its source. Importantly, investing in traceability systems would allow meat exports to meet the requirements of high-income countries and comply with their strict regulatory and quality standards for exporting processed beef products. **How?** Introduce a basic tagging system for the identification and registration of animals through a compartmentalization approach and develop uniform animal registration and identification software solutions. **Source of funding:** Private and public for initial investment
Assist private operators to invest in modern meat-processing equipment and technologies to develop innovative products **PoA activity: 3.3.1.**	**Why?** Mobilizing private sector investments in export-oriented processing and R&D is vital to developing innovative products adapted to consumer preferences in key target markets. Venturing into the manufacturing of further-processed products that have been heat treated allows exporters to circumvent the restrictions associated with FMD, as they are not subject to the same hygiene regulations. **How?** Introduce a meat-processing equipment scheme to assist operators in replacing old or acquiring new technologies and equipment to expand their operations, notably equipment that generates less environmentally harmful emissions. **Source of funding:** Private
Install green power generation systems, including solar and wind energy systems, and biogas production units converting manure **PoA activities: 3.2.6. and 3.2.7.**	**Why?** Animal waste provides organic farmyard manure with a potential value increase in the context of climate-smart farming practices by replacing chemical fertilizers. The conversion of manure to biogas is also an important source of renewable energy generation. **How?** A conducive policy and regulatory framework, together with an ambitious scheme for green investment, could be introduced to boost investments in developing the sector for manure energy and recycling-based, climate-smart organic fertilizers. PPP mechanisms could be introduced to boost renewable energy solutions in the livestock sector. **Source of funding:** Private, international donors
Develop a distribution network equipped with cold chain infrastructure to facilitate the efficient distribution of vaccines and cattle AI services **PoA activity: 3.2.5.**	**Why?** Ensuring an efficient and effective distribution system of vaccines and semen can only be established through significant investment in their cold chains. **How?** Develop a plan for procurement and distribution of cold chain equipment and establish a distribution network that includes placing cold chain equipment at key distribution points, such as veterinary offices, community health centres and livestock markets. **Source of funding:** Public

Product and market orientations

The proposed market orientation approach pursues three goals:

- **Short term:** Meeting domestic demand and gaining market shares in the fresh meat market segment in GCC countries, the white offal markets in the Far East and other related markets
- **Medium term:** Exporting higher value-added products to familiar regional markets
- **Long term:** Going into niche markets beyond the region.

When looking at potential market orientations for the meat sector in Sindh, the following factors must be considered.

1. This Strategy primarily emphasizes the **need to enhance per-unit animal productivity and improve the profitability of livestock production**. Only by mobilizing efforts and resources to increase the average carcass weight and develop indigenous beef breeds can local meat processors-cum-exporters capture international markets beyond the chilled meat markets of the GCC / Middle East.
2. **Pakistan cannot sell meat in most markets due to being classified by OIE as FMD Stage 2**. Therefore, resources should be mobilized to advance along the Progressive Control Pathway for FMD to progress to Stage 3, which would increase Pakistan's market access for bovine meat.
3. Considerable efforts should be made to **negotiate market access to new destinations and seek the recognition of sanitary and veterinary measures through bilateral agreements**. This competency falls under the ambit of the federal Ministry of Commerce, and is covered in the Pakistan Meat Export Strategy developed as part of the National Priority Sectors Export Strategy for the period 2020–2025.

If export destinations are diversified, local meat processors and exporters can access markets with greater purchasing power and market demand, thereby increasing export revenues for Sindh. Penetrating new markets will also allow the local meat industry to reduce its dependency on GCC countries and, consequently, its exposure to demand shocks in these countries.

Against this backdrop and based on global dynamics in the meat sector, there are sustained market options for traditional chilled meat products and growth opportunities for emerging, non-traditional products, including in new markets. To seize the opportunities in the current context, the meat industry in Sindh should pursue the following short-, medium- and long-term market trajectories.

Short term: Meeting domestic demand and fostering market development in the traditional fresh meat market segment in GCC countries

- Create the conditions necessary for local export-oriented meat processors to operate on a level playing field in the domestic market.

Equitable access to the domestic market would not only allow local export-oriented meat processors to generate additional revenue but also allow them to venture into new market segments internationally. For instance, failing to sell domestically the carcasses of exported prime cuts of bovine meat results in prohibitive and uncompetitive production costs given that the other remaining parts of the animal are sold at a big discount in the domestic market. A level playing field in the domestic market would consequently enable export-oriented businesses to progress towards greater product diversification competitively. However, the prevalence of unregulated practices coupled with a weak and outdated regulatory framework makes it virtually impossible for export-oriented slaughterhouses to compete with domestic wet markets, which have fewer costs as they do not comply with stringent hygiene and quality requirements, including traceability.

Creating the conditions necessary for local export-oriented meat processors to operate domestically would first require a progressive phase-out of the current price control regime (PoA activity 1.1.5.), paving the way for a liberalized market where a demand-supply balance would determine mutton and beef prices. This would allow meat processors who offer superior-quality meat to market their products domestically at a sufficiently profitable price (see PoA activity 3.1.3.), provided that hygiene and quality standards are enforced effectively. In addition to providing the local population with a broader range of higher-quality bovine meat, a free market would also stimulate competition and translate into higher levels of investment.

Basic regulations should be introduced for the meat industry, providing standards, procedures and requirements for producing safe meat and meat products (see PoA Activity 1.3.5.). The main focus areas should include hygiene requirements for abattoirs and meat-processing facilities, and basic requirements for chilling, packaging and labelling across all domestic markets.

- Increase market penetration in GCC countries by improving product quality, enhancing packaging and labelling, and increasing production volumes.

Pakistan's capacity to supply affordable halal chilled meat within short delivery times and at relatively competitive transportation costs provides the country with a competitive edge in GCC countries, notably in the carcasses market segment. In addition to maintaining its competitive edge in this niche market, Pakistan should take advantage of its strong trade relationships in the Gulf markets to explore higher value-added market segments, including boneless bovine meat in chilled and frozen processed meat products.

Medium term: Higher value-added products to regional markets

- Open up new strategic markets for fresh / chilled meat exports
- Diversify by offering frozen meat and value-added products in existing and new markets

Currently constrained by import bans imposed by most countries on Pakistan meat due to the prevalence of FMD, local meat processors-cum-exporters can diversify their production away from the fresh / chilled segment and develop more sophisticated, higher value-added processed meat products.

The presence of animal diseases in Pakistan makes access to new markets for the traditional fresh / chilled market segment – as well as the frozen meat market segment, which is subject to the same requirements – a slow and complex process requiring the mobilization of several actors, including federal institutions. In parallel, the meat industry should venture into the manufacturing of further processed products that have been heat-treated to circumvent the restrictions associated with FMD, as these products are not subject to the same hygiene regulations. The heat treatment process, or pasteurization, of meat products kills all harmful pathogens, making them safe for human consumption.

Heat-treated processed meat products include cooked (e.g. cured and cooked, and dried and cooked), heat-treated (e.g. sterilized) and canned products. Product development for those value-added products could include ready-to-cook and ready-to-eat meat products, such as cooked jerkies, canned corned beef, pre-grilled beef patties, boiled meat pieces in sauce, meat pastes and meat sausages. Developing such value-added products would allow Pakistani meat processors to access international markets, including high-income Asian countries, that have so far been beyond their reach due to the prevalence of FMD.

The meat industry can also explore opportunities for value added by utilizing by-products or lower-grade cuts of meat to produce pet food. This can help reduce waste and optimize resource utilization. Export opportunities exist in China, where the pet food market has been experiencing rapid growth, fuelled by increasing pet ownership, urbanization and a rising middle class. Due to high rates of pet ownership, Japan and the Republic of Korea have more mature and sophisticated pet food markets that value pet nutrition and health, leading to a demand for high-quality and functional pet food products.

Table 11: Regional markets for valued-added products

Target market	Segment	Products	Why?	How?
GCC countries	Importers	• Fresh carcasses • Frozen carcasses	• Strong commercial ties • Local capacity to supply halal chilled meat • Short delivery times • Competitive transportation costs • Presence of a large Pakistani community	• Comply with the local regulatory requirements, which include halal certification, labelling and packaging requirements, and food safety standards • Ensure ability to meet buyers' volume and frequency requirements
China	Processors Importers	• Cooked meat • Frozen meat • Pet food	• Booming demand for frozen meat in China, the largest importer globally • Geographic proximity • Duty-free access for chilled and frozen beef products (except for carcasses) • Longer shelf life	• Establish disease-free compartments and zones and ensure animal traceability (for fresh / chilled and frozen products) • Seek recognition of sanitary and veterinary measures • Ensure efficient and reliable logistics and transportation • Comply with strict import regulations

Central Asian countries, including Kazakhstan, Kyrgyzstan, Turkmenistan, Uzbekistan and Tajikistan	Processors Importers	• Vacuum-packed products • Fresh and chilled bovine meat • Frozen bovine meat	• Existing demand • Geographical proximity and possibility for shipments by road through Afghanistan	• Comply with local regulatory standards, including halal certification • Ensure efficient and reliable logistics and transportation • Ensure price competitiveness • Seek recognition of sanitary and veterinary measures
Malaysia, Indonesia and Viet Nam	Importers Distributors	• Semi-cooked or cooked deboned meat • Frozen meat	• Growing demand for meat products (halal-certified in the case of Indonesia and Malaysia) • Relatively easy processing and less investment • Longer shelf life	• Comply with local regulatory standards, including halal certification for Malaysia and Indonesia • Establish a trade network and proactively reach out to potential buyers • Ensure high-quality products, notably for Malaysia • Develop products that cater to consumers' preferences and tastes
Egypt and Jordan	Importers Distributors	• Fresh and chilled bovine meat	• Several export-oriented slaughterhouses have recently been allowed to export meat products to these markets • Important halal meat markets	• Comply with local regulatory standards, including halal certification • Reach minimum carcass weight requirements • Ensure price competitiveness
Hong Kong (China), China and Viet Nam	Processors Importers Distributors	• White bovine offal • Cooked meat	• High demand and high prices for these products	• Comply with local regulatory standards
Japan, Republic of Korea	Processors	• Pet food	• Mature and sophisticated pet food markets with high rates of pet ownership	• Comply with specific regulations and requirements related to health and safety standards, labelling, packaging, and documentation for pet food imports

Significant opportunities exist for Pakistan's export-oriented meat processors in the booming Chinese market, particularly in the frozen, boneless meat segment.

China has experienced a surge in meat consumption in recent years, driven by rising income levels, higher disposable incomes and a rapidly expanding middle class. Since the country is not yet capable of catering to the needs of its booming domestic demand, it imports ever greater quantities of meat, including bovine meat. As a result, imports of bovine meat from China have increased more than tenfold in the past decade, reaching $17.8 billion in 2022. This makes China the largest importer of bovine meat globally and captures 38% of world beef imports (United Nations Comtrade). Chinese imports of bovine meat consist almost exclusively of frozen boneless cuts (90%).

As the supply–demand gap is unlikely to be bridged through domestic production in the near future, the Chinese Government may grant market access to an increasing number of trading partners. Under the China–Pakistan Free Trade Agreement II, Pakistan bovine meat processors enjoy duty-free access to China for most bovine meat products classified under HS 0201 'fresh or chilled meat of bovine animals' and HS 0202 'frozen meat of bovine animals', and processed meat products classified under HS 1601 and HS 1602, including heat-treated meat. This provides Pakistan with a substantial advantage over other major beef exporters. A prohibitive import duty of 20% is still applicable to bovine carcasses (and semi-carcasses), whether frozen or chilled.

However, the prevalence of FMD and the incapacity of meat processors to comply with the stringent quality requirements and phytosanitary standards imposed by the Chinese authorities currently prevent beef imports from Sindh or any other province in Pakistan. Tapping into the opportunities offered by the Chinese market, particularly the Chinese Muslim community, will therefore require investments in quality and sanitary certifications to set up FMD-free zones.

Untapped opportunities exist in Southeast Asia

The expansion into the frozen beef market segment should also include other major markets in Asia, including Malaysia, Indonesia and Viet Nam, where similar consumption patterns can be observed. Opportunities exist for Sindh meat processors-cum-exporters to take advantage of these untapped markets, in particular through the strengthening of existing, if limited, trade relationships with bovine meat importers in these countries, including Malaysia and Viet Nam. In this regard, it must be stressed that the Malaysian Government is progressively allowing meat imports from a few approved suppliers in Pakistan. It is also noted that Pakistan has started negotiations for free trade agreements with Indonesia and Thailand, which are large meat-importing countries.

Central Asian countries also offer promising prospects

Given its geographic location, Sindh is well-placed to cater to the needs of Central Asian countries, in particular Kazakhstan, Uzbekistan and Turkmenistan. A specific focus should, therefore, be placed on promoting bovine meat in these countries, maximizing the country's logistical advantages to reach these landlocked countries by road through Afghanistan and ensure a consistent supply of bovine meat products, including frozen and chilled fresh meat, and vacuum-packed meat.

Long term: Going into niche markets beyond the region

- Diversify into high-income niche export markets for processed meat products that are certified organic or sustainably sourced.

North America and Europe offer niche markets

EU Member States, the United States and Canada are globally the most prominent processed-meat market players. Particular attention should, therefore, be paid to these markets, with a specific focus on countries that have a large Pakistani diaspora. For example, the United Kingdom is the second-largest importing country of prepared or preserved beef after the United States. The large North American market also offers promising business opportunities, driven by the United States' dynamic demand for imported processed beef in the past decade.

Entering the European and North American markets for meat products can be challenging due to the stringent regulations and requirements for food safety, animal welfare and environmental sustainability. Some key success factors to consider when targeting these markets include:

- Meeting regulatory standards: European and North American markets have strict regulations for meat imports, including labelling and certification standards. It is essential to ensure compliance with all regulations to avoid delays or rejections of shipments.
- Adhering to sustainability and traceability requirements: Many consumers in these markets are increasingly concerned about the environmental impact and ethical implications of meat production. It is essential to have transparent traceability systems in place to demonstrate the origin and quality of the meat, and to have environmentally sustainable practices in place.
- High quality standards: European and North American consumers are willing to pay a premium for high-quality meat products. Ensuring that meat products are consistently high-quality, with appropriate certifications to demonstrate their quality, is essential.
- Understanding consumer preferences: Market research and understanding the tastes and trends of the target consumer segments in these markets is crucial for success. In particular, the organic niche market is growing rapidly, and demand for meat products from animals that have been raised organically and sustainably is increasing.

The future of the sector

Unlocking the potential of Sindh's meat sector will require transformations throughout the value chain. These adjustments will result from the targeted efforts detailed in the strategy's PoA addressing the bottlenecks identified in the competitiveness constraints section above, and harnessing desired shifts in and opportunities for Sindh's meat industry.

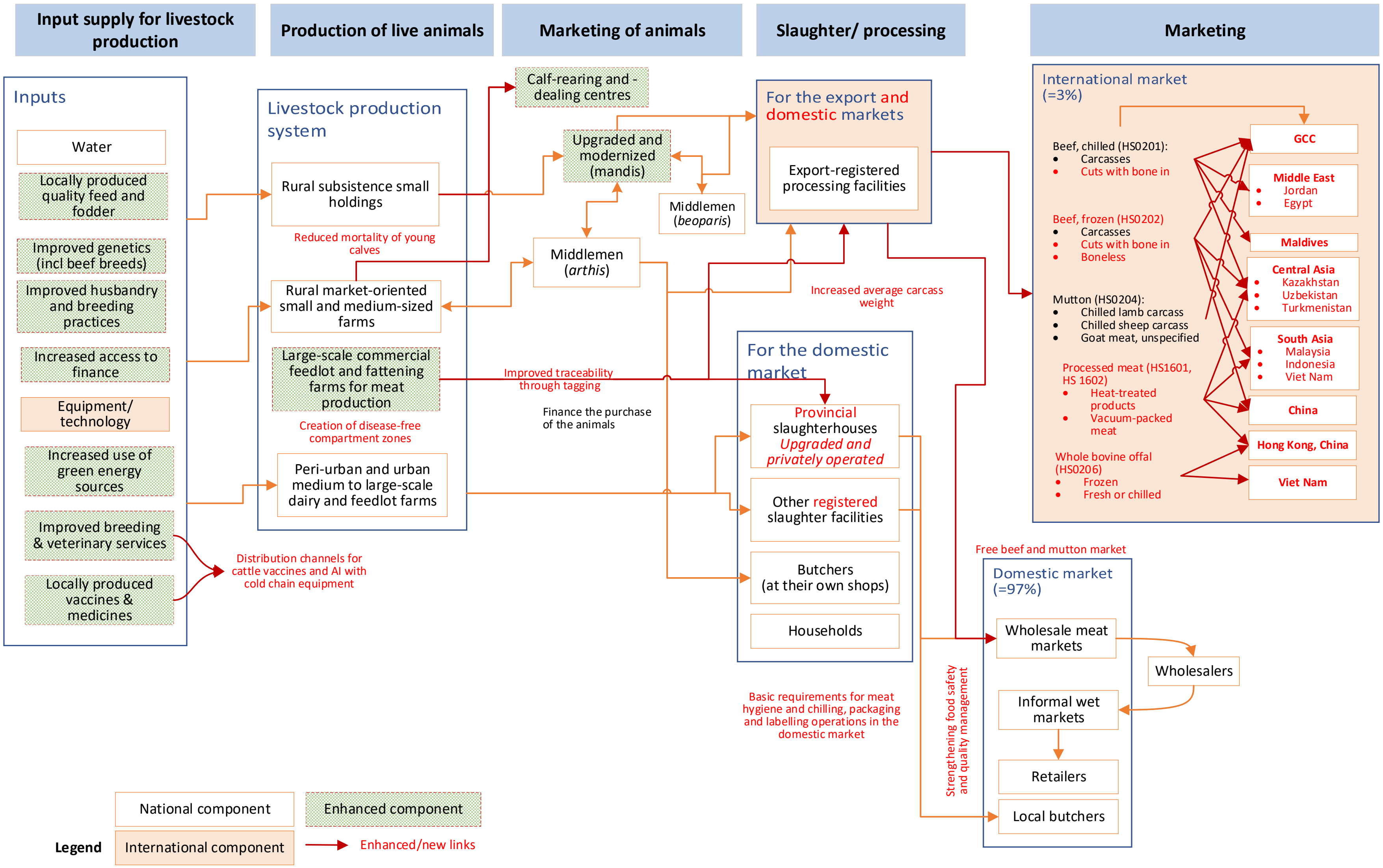
Based on current trends and innovations, some promising future strategic shifts along the value chain for Sindh's meat industry include:

- Enhancing per-unit animal productivity through improved animal nutrition, genetics and husbandry practices
- Promoting commercial livestock rearing, including feedlot farms and backgrounding practices

- Ensuring better access to an adequate and disease-free supply of raw material (livestock) through disease-free zones and compartments, and improved animal traceability
- Upgrading slaughter facilities and improving slaughterhouse management throughout Sindh for better quality and efficiency
- Creating an enabling environment that supports private initiatives and investment while ensuring food safety and quality
- Improving environmental management across the value chain and introducing climate-smart initiatives
- Fostering product diversification to gradually move out of commodity carcass sales to value-added processed products, notably for Eastern markets like China
- Identifying key export markets in the short, medium and long term for exporters from Sindh
- Creating conditions that allow meat processors-cum-exporters to compete in the local market on a level playing field.

These adjustments are reflected in the future value chain schematic (see Figure).

Figure 17: The future value chain



Source: ITC.

Implementation modalities and quick wins

The Meat SDS is not the strategy of any specific institution; rather, it is the strategy of Sindh and it endeavours to leverage the meat industry to contribute to Sindh's overall economic growth. Nevertheless, a strategy in itself is not enough to ensure the sector's sustainable development. Such development will require elaboration and coordination among various stakeholders for different activities. While the execution of these activities will allow the Strategy's targets to be achieved, success will depend on the ability of stakeholders to plan and coordinate actions tactically. Successful Strategy implementation, therefore, will require the following:

- A high level of commitment from relevant stakeholders
- Systematic coordination and communication between implementing bodies
- The readiness of the public and private sectors to allocate / mobilize resources.

Setting up the governance framework – LDC or similar

To achieve success and ensure the continuing viability of the Strategy, it is crucial to identify and create a reliable system that will facilitate its implementation. Having an effective institutional mechanism to oversee and coordinate the execution of the Strategy will help clarify everyone's role, make the most of scarce resources, assign responsibilities and accountability, and promote transparency among both public institutions and private sector organizations.

For the implementation of the Meat SDS, it is recommended that DoLF establish an LDC (or similar) as part of the Livestock Policy to provide financial, operational and technical support. It is also recommended that certain members of the LDC (or similar) be a part of the federal sector-specific council created under the aegis of TDAP and the Ministry of Commerce, and as part of the strategic trade policy framework.

Meat sector subcommittee

A meat sector subcommittee will be established under the LDC. This formal dialogue platform will require high-level involvement by both public and private members. Their role is crucial and will influence the effectiveness of Strategy implementation. It is recommended that one of the chairs be from the private sector and the other from the government to consult on key trade thematic areas, ranging from policy to regulations and trade negotiations.

The core team consulted during the Strategy design process was composed of a panel of representatives of key institutions, involving ministries and private sector representatives. As such, once its mandate is appropriately adjusted, this group of stakeholders, together with additional human resources as required, is best positioned to serve in the meat sector subcommittee.

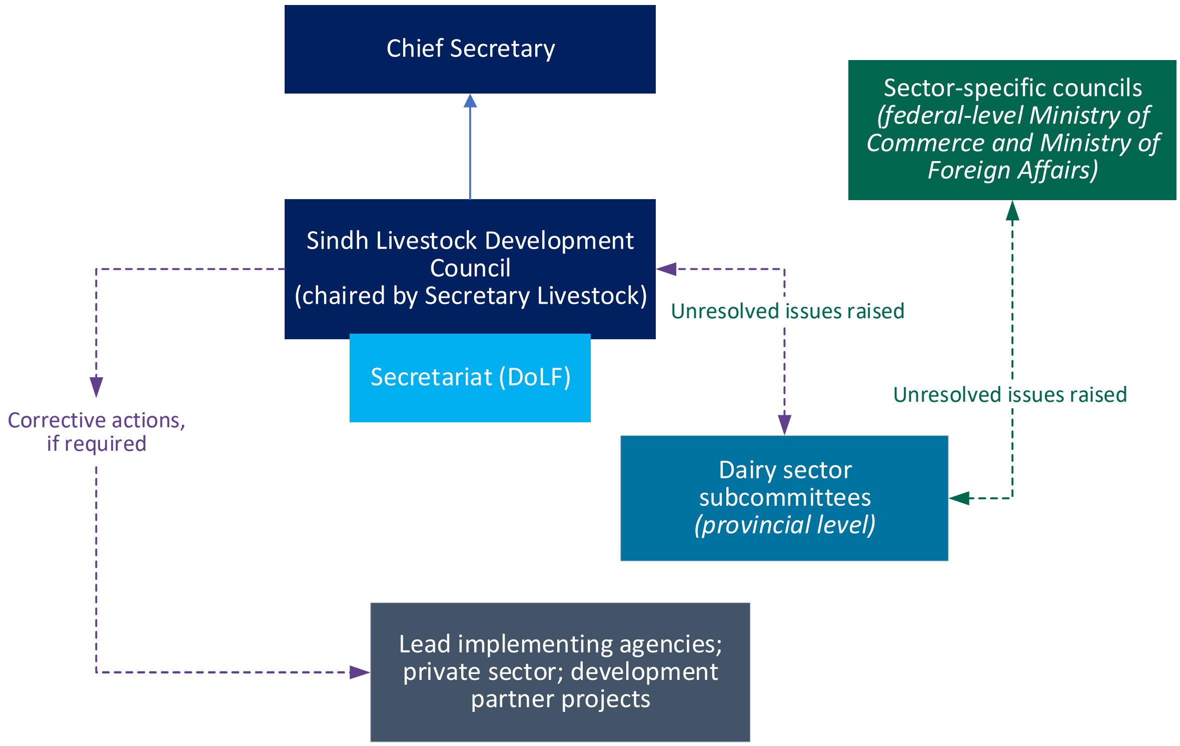
The meat sector subcommittee will meet quarterly and implement the following functions:

- Act as a consultative group in matters pertaining to the meat sector, enabling the private sector and government representatives to identify priority issues
- Coordinate and monitor implementation of the Strategy by the government, private sector, institutions or international organizations to ensure it is on track
- Identify and recommend the allocation of resources necessary for Strategy implementation
- Elaborate and recommend revisions and enhancements to the Strategy so that it continues to best respond to the sector's needs and long-term interests
- Propose key policy changes to be undertaken based on strategic priorities and promote these policy changes among national decision makers
- If Strategy implementation requires adjustments to achieve the expected results, the meat sector subcommittee will have the responsibility to undertake all corrective measures.

Specific tasks falling under these broad areas of activities include:

- Formulate project proposals, including budgets, for implementation of Strategy activities
- Develop annual and twice-yearly workplans for approval by the LDC
- Collect information from project implementation and prepare regular monitoring reports to be submitted to the LDC.

Figure 18: Proposed institutional framework for meat sector development



Source: ITC.

The LDC will be established in line with the recommendation in the Livestock Policy to monitor the implementation of the Meat SDS and share findings every quarter with the Secretary, DoLF. Inputs and outputs will be monitored against the indicators and targets in the PoA. An independent midterm review and evaluation will be carried out by DoLF in coordination with any agencies concerned.

Financial resource mobilization for implementation

While resource mobilization is only part of the solution, it plays a crucial and indispensable role in supporting Strategy implementation. An integrated resource mobilization plan should be developed as soon as the Strategy is adopted. Resource mobilization involves planning the sequencing of communications with donors, project design, project proposals / applications, and resource collection and management. This should facilitate, leverage and strengthen the impact of diverse financial sources – national resources, development aid and private investment – to support sustainable and inclusive implementation.

- National resources directly from the budget and from support programmes: The government will need to validate defined minimum budget support for Strategy implementation. Such support for Strategy activities will demonstrate government commitment to the initiatives.
- Alignment of donor support and interventions with the Strategy: The sector forum and authorities will need to capitalize on the significant momentum gained as part of the Strategy design process and leverage it for smooth and efficient implementation. International development agencies can use the Strategy as the logical framework for their programmes – benefits from the favourable conditions for the operation could include political endorsement, private sector buy-in and improved collaboration with national institutions. The PoA should serve the sector forum as well as national institutions to improve communication and facilitate the negotiation, planning, coordination and evaluation of commitments made in the context of development aid, in particular through the development of programmes and project proposals aligned with the Strategy's priorities.
- National and foreign investment: The current Strategy design core team is composed of representatives of national institutions, the trade support network and the private sector. If the sector forum becomes the coordinating body, the Strategy should benefit from a solid channel of communication capable of conveying reliable information to both companies (about export-related opportunities in the industry) and the government (on the needs that investors have identified to

operate successfully). Investment in Sindh could serve as a valuable driver of export development. Even so, it must be targeted at specific prospects to benefit the industry's development.

The various implementation modalities detailed above will determine the success of Strategy implementation. However, high-level support from the government, in collaboration with the strong championship by the business sector, will be the real driver of successful Strategy implementation.

Recommended 'quick wins' for Year 1 implementation

The following activities have been identified by stakeholders as having high priority and high return, and are therefore recommended for implementation in the first year. The objective of the activities in the first year is to establish a solid foundation for the strategy to implementation.

Policy and regulatory activities

Provincial Assembly of Sindh: Declare 'meat' as a separate agricultural economic sector and advocate that all oversights and controls that apply in the meat sector fall exclusively under the jurisdiction and management of the provincial government, as per the Eighteenth Amendment. **PoA activity 1.1.1.**

DoLF: Set up a task force comprising public and private sector stakeholders, civil society organizations, and legal and technical experts to review, streamline and harmonize all legislation that applies to the livestock sector in Sindh and strengthen coordination and implementation mechanisms. **PoA activity 1.1.2.**

Provincial Assembly of Sindh: Amend the Sindh Local Government Act, 2013 to transfer the functions and powers to provide and maintain public-sector slaughterhouses from corporation, municipal committee or town committee to GoS. **PoA activity 1.1.3.**

Provincial Assembly of Sindh: Amend the Sindh Animals Slaughter Control (Amendment) Act, 2004 and declare DoLF the custodian and implementer of the Act rather than the Local Government Department. **PoA activity 1.1.4.**

Institutional framework

DoLF: Establish the Sindh LDC comprising three subcommittees (dairy, meat and leather) to guide sector development and oversee implementation of the Sindh Dairy, Meat and Leather SDSs. **PoA activity 1.1.6.**

Federation of Pakistan Chambers of Commerce and Industry: Support meat processors to establish and operationalize a national meat processor-cum-exporters association defending the interests of private operators, with branches in the provinces. **PoA activity 3.3.4.**

Sindh Bureau of Statistics: In collaboration with DoLF, develop a comprehensive roadmap for conducting a province-wide livestock census. This will involve collecting basic statistics on livestock population and production at various administrative and geographic levels, with a particular focus on the district level. **PoA activity 1.2.1.**

Quality and skills

DoLF: Conduct, in collaboration with private meat processors, practical on-the-job training for slaughterhouse workers, notably on good hygiene practices, sanitary control and professional animal slaughtering, and ante-mortem and post-mortem inspections. **PoA activity 3.2.3.**

DoLF: Conduct a comprehensive assessment of the operations and infrastructure of existing local government-run slaughterhouses in Sindh and develop a provincial plan to upgrade and modernize them. **PoA activity 3.2.2.**

Sindh Public Procurement Regulatory Authority (SPPRA): Launch a call for tenders to establish private vaccine and medication production lines in line with international standards. **PoA activity 3.1.1.**

SFA: Carry out capacity building and enhancement of the food inspection services and appoint / recruit veterinarians and meat / dairy technologists. **PoA activity 1.3.4.**

The Plan of Action

To achieve the vision and strategic objectives discussed above and agreed upon with all sector stakeholders, a robust, actionable and realistic strategic PoA is required. This is provided in the section below and constitutes the heart of this Strategy.

The PoA is structured along the three strategic objectives and operational objectives described above. For each objective, the PoA outlines detailed activities and their implementation modalities, which include:

- **Priority level:** 1 being the highest, 3 being the lowest
- **Period:** The desired time frame of the activity
- **Targets:** Quantifiable targets that allow completion monitoring of the activity during the implementation stage
- **Leading implementing partner**: One single accountable lead institution per activity. The institution can have a technical role or can have solely an oversight and coordination role
- **Supporting implementing partners:** Any institution that should be involved at any stage of the activity's implementation.

Activities highlighted in green are of high priority and recommended for immediate implementation.

Plan of Action for the Meat Sector Development Strategy, Sindh, 2023–2027

Strategic objective	Operational objective	Activity	Priority (1=Highest)	Period 2023	2024	2025	2026	2027	Targets	Leading implementing partner(s)	Supporting implementing partners
1. Create an enabling environment for sustainable private-sector-led growth in the meat sector	**1.1. Streamline and simplify the institutional, legal and regulatory framework**	1.1.1. Ministry of Commerce to declare meat as a separate agricultural economic sector and advocate that all applicable oversights and controls in the meat sector fall exclusively under the jurisdiction and management of the provincial government, as per the Eighteenth Amendment. Accordingly, declare income derived from selling meat and meat products as agricultural income under the Sindh Agricultural Income Tax Ordinance, 2000.	1						• Notification released by the Ministry of Commerce • The Sindh Agricultural Income Tax Ordinance, 2000, amended	Provincial Assembly of Sindh	• DoLF • Law, Parliamentary Affairs and Criminal Prosecution Department • Ministry of Commerce • Private sector
		1.1.2. Considering 1.1.1., create a task force to review, streamline and harmonize all legislation applicable to the livestock sector in Sindh, including amending provincial tax laws to simplify the taxation of livestock and livestock by-products. Strengthen coordination and implementation mechanisms. *The task force should comprise public and private sector stakeholders, civil society organizations, and legal and technical experts.*	1						• Task force formed • Livestock-related legislation reviewed and harmonized	DoLF	• Sindh Board of Revenue • Law, Parliamentary Affairs and Criminal Prosecution Department • Private sector
		1.1.3. Amend the Sindh Local Government Act, 2013 to transfer the power and responsibility to provide and maintain public-sector slaughterhouses from corporations (metropolitan corporations, district municipal corporation or municipal corporation), municipal committee or town committee to GoS. *Leather Strategy activity 1.1.1 and Sindh Livestock Policy activity*	2						• Sindh Local Government Act, 2013, amended by 2024	Provincial Assembly of Sindh	• DoLF
		1.1.4. Amend the Sindh Animals Slaughter Control (Amendment) Act, 2004, and declare DoLF the custodian and implementer of the Act rather than the Local Government Department.	2						• Sindh Animals Slaughter Control (Amendment) Act, 2004, amended by 2024	Provincial Assembly of Sindh	• DoLF

Strategic objective	Operational objective	Activity	Priority (1=Highest)	Period 2023	2024	2025	2026	2027	Targets	Leading implementing partner(s)	Supporting implementing partners
		1.1.5. Remove beef and mutton from the list of essential commodities as defined under the Sindh Essential Commodities Price Control and Prevention of Profiteering and Hoarding Act, 2005 so that these commodities will no longer be subject to price fixing by the district officers, as stipulated under the Act.	1						• Beef and mutton removed from the list of essential commodities	Provincial Assembly of Sindh	• DoASP • DoLF
		1.1.6. Establish the Sindh LDC comprising dairy, meat and leather subcommittees to guide sector development. The Board and its subcommittees should form a public–private dialogue platform, including academia, and oversee the implementation of the Sindh Dairy, Meat and Leather SDSs. *Leather Strategy 2.1.1.* *Dairy Strategy 3.1.1.*	1						• Sindh LDC and its subcommittees established by 2024	DoLF	• Department of Industries and Commerce • AQD • PSQCA • SFA • PDA • DCFA • Meat processors-cum-exporters association (to be established)
	1.2. Ensure access to reliable livestock data	1.2.1. Conduct a livestock census throughout Sindh every five years to collect basic statistics on livestock population and production at every possible administrative and geographic level (at the district level in particular), including registering farm households and slaughter facilities. *Census to be conducted with the consent of DoLF to coordinate and ensure interdepartmental cooperation.*	1						• Provincial livestock census conducted by the end of 2024	Sindh Bureau of Statistics	• DoLF • PDD • Local governments • National Database and Registration Authority
		1.2.2. Harmonize and standardize data collection and compilation techniques between the different departments involved in livestock data monitoring in Sindh: • Develop a harmonized data collection system and methodology • Conduct training of data numerators • Organize periodic meetings to reconcile production and export data based on standard operating procedures, and make the information publicly available.	1						• Methodology for data collection and compilation developed • Ten staff from the different institutions involved trained	Sindh Bureau of Statistics	• DoLF • MNFSR • AQD • Local governments • Private sector

Strategic objective	Operational objective	Activity	Priority (1=Highest)	Period					Targets	Leading implementing partner(s)	Supporting implementing partners
				2023	2024	2025	2026	2027			
	1.3. Strengthen food safety and quality management in the meat sector	1.3.1. Establish a specialized food testing laboratory at the SFA.	2						• SFA food testing laboratory established by 2024	SFA	• Finance Department
		1.3.2. Build the capacity of technicians in food testing laboratories to undertake microbiological analysis and provide certified meat testing services.[11] Support the food testing laboratories to advance their accreditation process with ISO 17025, mainly by providing conformity assessment services.	1						• At least one laboratory accredited with ISO 17025 by 2026 • Certified meat testing services provided	SFA	• PSQCA • PCSIR • DoLF • Sindh Industrial Analytical Centre • International Centre for Chemical and Biological Sciences, University of Karachi
		1.3.3. Introduce a scheme to provide mobile food testing labs to private operators with GoS oversight control mechanisms.	1						• At least 50 mobile food testing labs provided by 2026	DoLF	• Private sector • SFA • PSQCA • Relevant municipal corporations
		1.3.4. Build capacity of food inspection services and appoint / recruit veterinarians and meat / dairy technologists. *Sindh Livestock Policy activity*	1						• 250 SFA staff trained per year • At least 750 veterinarians and meat / dairy technologists appointed each year	SFA	• PSQCA • National Animal and Plant Health Inspection Service

[11] Laboratories to include, but not be limited to, PSQCA, PCSIR, International Center for Chemical and Biological Sciences, and Industrial Analytical Centre.

Strategic objective	Operational objective	Activity	Priority (1=Highest)	Period					Targets	Leading implementing partner(s)	Supporting implementing partners
				2023	2024	2025	2026	2027			
		1.3.5. Introduce basic requirements for meat hygiene, chilling, packaging and labelling operations in the domestic meat market. The regulations should include enforcement measures involving prohibitive monetary and criminal penalties. Undertake outreach activities and awareness-raising campaigns for the general public to promote the virtues of quality and safe meat consumption and the importance of the traceability of meat products.	2						• Hygiene requirements introduced • Awareness-raising campaign conducted	SFA	• PSQCA • Health Department • DoLF • Karachi Metropolitan Corporation and other city or zonal corporations • Law, Parliamentary Affairs and Criminal Prosecution Department • Information, Science and Technology Department • Private sector
		1.3.6. Harmonize existing halal certification systems by creating an independent and internationally accredited inspection and certification body for halal meat in Sindh. Create a provincial-level halal implementation council as a government body with representation from the private sector and religious scholars, with an extended scope of operations.	1						• An independent inspection and certification body for halal meat in Sindh is created and internationally recognized	PSQCA	• SFA • Auqaf, Religious Affairs, Zakat and Ushr Department • Pakistan National Accreditation Council • Ministry of Science and Technology • Private sector
2. Improve the productivity and profitability of livestock production while building climate	**2.1. Promote climate-smart feed production for optimal animal nutrition**	2.1.1. Promote optimized animal feed production technologies and techniques by introducing matching grants and technical assistance to private operators. Activities to be covered include: • Hay and silage making • Pelletized feed and total mixed ration formulation and production[12] • Climate-smart, drought-resistant, high-protein, high-yield, non-GMO, perennial fodder production and preservation (including soybean, alfalfa, canola and maize). *GoS is to play an oversight and regulatory role.*	1						• Programme launched • Grant mechanism introduced	Finance Department	• DoLF • Investment Department • DoASP • DCFA • PDA • Meat processors-cum-exporters association (to be established)

[12] To be developed in line with the Pakistan Standard Specification for Balanced Feed Mixture for Livestock (1st revision) reference 234-2016.

Strategic objective	Operational objective	Activity	Priority (1=Highest)	Period 2023	2024	2025	2026	2027	Targets	Leading implementing partner(s)	Supporting implementing partners
change resilience		2.1.2. Develop a plan for fodder production on the left bank of the Indus River to support private operators with prospects for growing grazing pastures and silage crops adapted to local climates. This should include: • Provision of soft terms for the long-term lease of irrigated lands (with access to primary transport infrastructure) • Exemption from land revenue and agricultural income tax.	2						• Programme launched • Number of hectares of irrigated land leased (to be defined by GoS)	DoLF	• Irrigation Department • PDD • Investment Department • DoASP • Transport and Mass Transit Department • DCFA • PDA • Meat processors-cum-exporters association (to be established)
		2.1.3. Based on a needs assessment, develop and publish PPP tenders for establishing feed mills at the divisional level in rural Sindh. *Feed mills are to be operated by private operators, with GoS providing basic infrastructure and regulations.*	2						• At least 20 feed mills established in priority areas by the end of 2025	DoLF and SPPRA	• Investment Department • Private sector • Sindh Enterprise Development Fund (SEDF) • Sindh PPP Unit • PDA • DCFA • Meat processors-cum-exporters association (to be established)
		2.1.4. Introduce a PPP initiative for quality and climate-resilient fodder seed production through a Memorandum of Understanding with selected farmers determining the type of fodder to be cultivated, the area under cultivation, the quality of seeds to be produced and the procurement price. • The initiative shall include training farmers on fodder cultivation and fodder seed production. • Testing, cleaning, packing and distribution shall also be ensured. • A pilot project could be implemented using irrigable land allocated to SAU for research.	1						• 100 farmers enrolled under the Memorandum of Understanding and supplying fodder seeds • At least 200 acres maintained for fodder seed production under the programme	DoASP	• DoLF • PCSIR • PSQCA • SEDF • Sindh PPP Unit • SPPRA • SAU
		2.1.5. Create a Sindh fodder research institute within the Faculty of Crop Production, SAU, to develop climate-smart,	2						• Sindh fodder research institute	SAU	• SBBUVAS • PCSIR

Strategic objective	Operational objective	Activity	Priority (1=Highest)	Period 2023	2024	2025	2026	2027	Targets	Leading implementing partner(s)	Supporting implementing partners
		highly nutritive and high-yield perennial fodder seeds, low-cost organic feed and a balanced ratio for local production. *Institute to be established through a joint venture with PCSIR and private meat and dairy processors, and be linked for proximate fodder analysis with animal nutrition labs in SAU or at SBBUVAS.*							created and operationalized		• DoASP • DCFA • PDA • Meat processors-cum-exporters association (to be established)
		2.1.6. Launch annual calls for research proposals and provide grants to projects in animal nutrition research. The research topics are to be defined through a technical group comprising representatives from livestock farmers groups, dairy and meat processors, DoLF and the scientific community.	3						• Up to five research projects supported every year	DoLF	• SAU • SBBUVAS • SIAH • PCSIR • DoASP • Private sector
		2.1.7. Conduct training to build the knowledge and skill of livestock farmers on: • Optimized animal diets and nutrition to enhance feed efficiency and reduce methane emissions • Fodder production, conservation and utilization, including improved forage crop varieties and production technologies for local conditions • Sustainable pasture and rangeland management practices, including rotational grazing practices.	1						• 1,500 farmers trained per year (50 training sessions of five days involving 30 participants), starting in 2024	SAU	• SIAH • DoLF • DoASP • Private sector
	2.2. Foster genetic improvement of local livestock breeds	2.2.1. Establish a laboratory of animal genetics and breeding for genetic mapping and genetic marker-assisted selection for livestock breeding. Use DNA markers associated with milk and meat production traits to rapidly identify and select superior native breeds (e.g. Red Sindhi cows and Kundhi buffaloes) for inclusion in breeding programmes. The initiative should include the creation of a gene bank for genetic material preservation.	1						• Red Sindhi and Kundhi with higher milking potential identified and registered • At least 50 progeny-positive bulls identified and semen commercially available by the end of 2027	DoLF (Directorate of Animal Breeding)	• SAU • SBBUVAS • PCSIR • Pakistan Agricultural Research Council • Breeder associations
		2.2.2. Develop and publish a PPP tender for the establishment of an exotic cattle breeding farm to produce resistant, high-yielding breed variants adapted to the harsh local climatic conditions through advanced genetic improvement technologies	2						• At least one exotic cattle breeding farm established by 2025	DoLF	• Private sector • SEDF • SIAH

Strategic objective	Operational objective	Activity	Priority (1=Highest)	Period					Targets	Leading implementing partner(s)	Supporting implementing partners
				2023	2024	2025	2026	2027			
		(i.e. embryo transfer technology and AI) and develop high-yield cross-breed offspring calves. *Farms(s) to be established through direct support to corporate operators, with oversight from GoS.*									• Sindh PPP Unit • SPPRA
		2.2.3. Use matching grants to support private processors in establishing: • SPUs • Beef and mutton breeding farms • Embryo extraction units and associated embryo transplant supply services.	2						• Scheme introduced	DoLF (Directorate of Animal Breeding)	• SIAH • Private sector
		2.2.4. Launch expressions of interest to upgrade / modernize the three public SPUs established in Sindh for beef and dairy breeds and increase their capacities. *SPUs could be operated through PPPs, with GoS playing an oversight and regulatory role. The functions and powers to manage, operate and maintain these units should be progressively transferred to private operators.*	1						• SPUs upgraded to international standards by 2026 • Responsibility and power to operate public SPUs transferred to the private sector	DoLF (Directorate of Animal Breeding)	• SIAH • Sindh PPP Unit • SPPRA • Private sector
		2.2.5. Undertake continuous skill and competency development in breeding practices and technologies, including AI technology and embryo transfer technology. The targeted audience includes veterinary graduates, DoLF staff, breeding associations[13] and private technicians. *Training courses could be conducted within the Department of Animal Breeding and Genetics, Faculty of Animal Husbandry and Veterinary Sciences, SAU; and the Department of Animal Breeding and Genetics, Faculty of Animal Production and Technology, SBBUVAS. The capacities of these Departments should be assessed and strengthened accordingly.* *Sindh Livestock Policy activity*	1						• Training institute established by 2025 • 1,000 technicians trained per year	SAU / SBBUVAS	• DoLF (Directorate of Animal Breeding) • SIAH • PDA • Meat processors-cum-exporters association (to be established)

[13] Six associations have been established to date, namely, Kundi Breed Conservation and Improvement Association; Red Sindhi Breed Conservation and Improvement Association; Thari Breed Conservation and Improvement Association; Kankrej Breed Conservation and Improvement Association; Kamori Goat Breed Conservation and Improvement Association; Pateri Goat Breed Conservation and Improvement Association.

Strategic objective	Operational objective	Activity	Priority (1=Highest)	Period 2023	2024	2025	2026	2027	Targets	Leading implementing partner(s)	Supporting implementing partners
		2.2.6. Based on a needs assessment, implement a provincial AI programme to improve the genetic potential of nondescript local breeds through cross-breeding with better-quality semen. The programme should include the following components: • Provision of improved genetics to dairy and beef farmers through inseminations • Conduct training for AI technicians in AI services • Conduct awareness-raising campaigns on breeding practices to discourage cross-breeding of identified indigenous breeds and preserve the genetic pool for existing cattle populations and biodiversity. The first phase would be a pilot project in two rural upper and lower Sindh districts. A separate peri-urban pilot project in Karachi or Hyderabad could also be launched.	2						• 5,000 farmers reached in 100 villages per year • At least 2,000 doses inseminated with 30 AI technicians trained in AI services	DoLF (Directorate of Animal Breeding)	• SIAH • SAU • SBBUVAS
	2.3. Reduce the mortality rate of male calves and implement improved practices across the entire value chain	2.3.1. Implement an outreach programme to take male baby calves (i.e. within the first three months of birth) from rural areas of Sindh – with a financial compensation mechanism for farmers – for backgrounding / fattening at the facilities of private meat processors-cum-exporters. Newborn calves rescued under the programme will be identified and registered through a tagging system (see Activity 3.1.7.) *Programme to be implemented through a PPP joint venture model with a licence to SPV companies under Section 42 of the Companies Act, 2017, with equal participation and ownership for the public and the private sector. GoS is to play an oversight and regulatory role.*	1						• Programme launched by 2024 • 75,000 calves saved in the first year of implementation	DoLF, and private sector (PPP joint venture model)	• SAU • SBBUVAS
		2.3.2. Based on a cost-benefit analysis, establish community-level male calf-rearing and -dealing centres with basic support amenities (i.e. supervisory personnel, feed, water arrangements, etc.), providing farmers with a point of access to processors-cum-exporters – and vice versa – for off-taking the calves. Train farmers in selection, management, nutrition, health and marketing.	2						• At least five calf-dealing centres established by 2025	DoLF, and private sector (PPP joint venture model)	• SAU • SBBUVAS

Strategic objective	Operational objective	Activity	Priority (1=Highest)	Period 2023	2024	2025	2026	2027	Targets	Leading implementing partner(s)	Supporting implementing partners
		Centres are to be established through a PPP joint venture model with a licence to SPV companies under Section 42 of the Companies Act, 2017[14] and operated by private operators, with GoS providing basic infrastructure and playing an oversight and regulatory role.									
		2.3.3. Develop and implement a Sindh milk replacer programme to prevent dairy farmers and breeders from culling male calves: • Encourage international producers of synthetic replacers for calves' milk to set up manufacturing and production facilities in Sindh by granting federal-level sales tax exemption applicable to greenfield industrial undertakings • Provide grants and financial support to create a viable and sustainable distribution network.	2						• At least one milk replacer manufacturing unit established by 2025 • At least 20,000 farmers supplied with calves' milk replacers over the lifespan of the programme	DoLF	• SEDF • SAU • Federal Board of Revenue • Ministry of Finance • PDA • Meat processors-cum-exporters association (to be established)
		2.3.4. Conduct a series of modular training programmes targeting rural farmers – particularly women smallholder microentrepreneurs – on improved livestock husbandry, breeding practices, and backgrounding and feedlot fattening business management. Informative audiovisual material in Urdu and Sindhi shall be used to improve farmers' awareness. *Activity to be implemented through a PPP model whereby corporate processors-cum-exporters conduct training under long-term services contracts, with outreach and oversight from GoS.*	2						• At least 5,000 farmers trained per year	DoLF	• SAU • SBBUVAS • Women Development Department • Sindh PPP Unit • PDA • Meat processors-cum-exporters association (to be established)
		2.3.5. Establish an academic forum committee to strengthen and systematize a feedback loop between the livestock industry, academia and the public sector, comprising three subcommittees for the meat, dairy and leather subsectors. The committee and its subcommittees will guide the skills development agenda and support academic research and extension on the livestock value chains, including: • Improving links between the industry and Ph.D. students in applied beef and mutton value added research / training	1						• Academic forum committee operationalized • At least 500 Ph.D. students in applied research with industry players each year	Universities and Boards Department	• SAU • SBBUVAS • Sindh Higher Education Commission • Federation of Pakistan Chambers of Commerce and Industry and

[14] Ibid.

Strategic objective	Operational objective	Activity	Priority (1=Highest)	Period 2023	2024	2025	2026	2027	Targets	Leading implementing partner(s)	Supporting implementing partners
		• Developing a diploma in meat technology through institutional collaboration with modern slaughterhouses • Establishing partnerships with high-level international research institutions to train and enhance the capabilities of local researchers, notably through research grants • Using universities as business incubation centres in collaboration with chambers of commerce and progressive investors.							• Meat technology diploma developed		Chambers in major cities • Meat processors-cum-exporters association (to be established) • PDA
3. Develop a sustainable, integrated and disease-free livestock supply chain and increase local value added	**3.1. Foster efficient management and control of TADs and improve livestock traceability**	3.1.1. Launch a call for tenders to establish private vaccine and medication production lines in line with international standards and adapted to local conditions to ensure affordable and efficient supply to all farms in Sindh. *Production lines are to be established through a PPP joint venture model with a licence to SPV companies under Section 42 of the Companies Act, 2017,[15] with long-term management control from the private sector (and a Board of Directors with representatives from the public and private sector). GoS is to provide basic infrastructure, protocols and oversight.* *Dairy Strategy 2.3.1.*	1						• At least one production line operationalized by 2025	SPPRA	• SIAH and the private sector (PPP joint venture model)
		3.1.2. Identify, notify and develop animal disease control zones and compartments in line with OIE guidelines and operated by private operators: • Phase 1: Undertake a pilot initiative for animal disease control compartments by creating a quarantine zone for all livestock on the parameters for compulsory vaccination and post-vaccination lairage before allowing fully vaccinated and rested animals in the disease-free compartment. A complete cold chain system with refrigerated facilities and transportation from vaccine production units – or ports for imported medicine – to processors shall also be established. • Phase 2: Identify, notify and develop additional animal disease control compartments, including implementation of an animal identification and tagging system.	1						• Pilot animal disease control compartment developed by the end of 2024 • At least five animal disease control compartments developed by the end of 2026 • At least two animal disease control zones identified and notified by 2027	DoLF, and the private sector (PPP joint venture model)	• Provincial Assembly of Sindh • Transport and Mass Transit Department • National Logistics Cell • AQD • National Veterinary Laboratory • MNFSR

[15] *Ibid.*

Strategic objective	Operational objective	Activity	Priority (1=Highest)	Period 2023	2024	2025	2026	2027	Targets	Leading implementing partner(s)	Supporting implementing partners
		Initiative to be undertaken through a PPP joint venture model with a licence to SPV companies under Section 42 of the Companies Act, 2017.[16]									
		3.1.3. Establish an Autonomous Epidemiology and Infectious Disease Control Authority to monitor outbreaks of infectious diseases and be responsible for the supply of animal-related vaccination and medicines to shorten the reaction time in case of outbreaks. ***Note:*** The Sindh Animal Disease Control Act, 2022 provides for the establishment of a Sindh Animal Disease Control Authority.	2						• Authority established and operationalized	DoLF	• SIAH • AQD
		3.1.4. Establish, under the aegis of DoLF, a livestock quarantine facility for animals moving to a farm from a foreign market or another holding to ensure quarantined delivery to the animal disease control compartments and zones.	2						• Animal quarantine house created by 2026	AQD	• DoLF • National Logistics Cell • Pakistan Customs • Karachi Port Trust • Private sector
		3.1.5. Undertake public awareness and advocacy campaigns about TADs and the benefits of vaccination.	1						• Awareness-raising campaign conducted	DoLF	• SAU • SIAH • Information, Science and Technology Department • SPPRA
		3.1.6. Launch a call for proposals to introduce, in collaboration with corporate processors-cum-exporters, a pilot project for a feedlot farm-to-slaughter tagging system for carcass traceability for export markets. The project is then to be scaled up across Sindh.	2						• Pilot project launched by 2024	DoLF, SPPRA (for advertising)	• Information, Science and Technology Department • National Database and Registration Authority • Private sector
		3.1.7. Introduce a basic tagging system for the identification and registration of animals through a compartmentalization approach: • Phase 1 – Develop a uniform software solution for animal registration and identification and introduce the mandatory tagging of all newborn calves for disease-free	1						• The identification by farmers of all newborn calves with a tag set in disease-free compartments to	DoLF	• AQD • Information, Science and Technology Department

[16] *Ibid.*

Strategic objective	Operational objective	Activity	Priority (1=Highest)	Period					Targets	Leading implementing partner(s)	Supporting implementing partners
				2023	2024	2025	2026	2027			
		compartments. The tagging of newborn calves would also apply to the outreach programme to save male calves (see activity 1.1.2.). • Phase 2 – Adopt mandatory tagging for disease-free compartments and zones. Tagging and vaccination could also be jointly undertaken.							become a legal requirement by 2025 • 25% of animals tagged per year, starting in 2025 (for animals outside animal disease control compartments and zones, through a phased approach)		• National Database and Registration Authority • Pakistan Software Houses Association for IT & ITES • DCFA • PDA • Meat processors-cum-exporters association (to be established)
	3.2. Develop an integrated and sustainable meat industry with strong supply chains, logistics and green energy solutions	3.2.1. Develop and publish PPP tenders for feedlot development and management in Sindh, including backgrounding for feedlots. *A pilot project could be launched in an animal disease control compartment (see activity 3.1.2.) whereby GoS provides long-term land leases and basic facilities for long-term management by private operators.*	2						• PPP tenders advertised • Up to five projects supported between 2024 and 2027	DoLF	• SEDF • Sindh PPP Unit • SPPRA • Private sector
		3.2.2. Based on a comprehensive assessment of existing slaughtering infrastructure (including environmental impact), design a programme for Sindh to upgrade and modernize local government-run slaughterhouses and establish new facilities in the province' major cities. The facilities shall be equipped with basic amenities – such as lairage, cold storage facilities and halal slaughter boxes – and ensure proper waste management and disposal (e.g. drainage systems, wastewater treatment, solid waste management, anaerobic digesters for biogas production, etc.). *Public slaughterhouses could be operated through PPPs, with GoS playing an oversight and regulatory role and long-term management contracts with private operators. The power and responsibility to manage, operate and maintain these facilities should be progressively transferred to private operators.*	2						• Needs assessment study completed by 2024 • All public slaughterhouses upgraded by 2027	DoLF	• SFA • SEPA • PDD • Health Department • Environment, Climate Change and Coastal Development Department • *Taluka* Municipal Administrations • SEDF • Sindh PPP Unit • Private sector

Strategic objective	Operational objective	Activity	Priority (1=Highest)	Period 2023	2024	2025	2026	2027	Targets	Leading implementing partner(s)	Supporting implementing partners
		3.2.3. Conduct practical on-the-job training for slaughterhouse workers on the following topics: • Good hygiene practices and sanitary control • Personal safety and importance of zero loss time • Pre-slaughter handling of animals • Halal slaughtering • Professional animal slaughtering and zero-defect hides and skins flaying technology • Ante-mortem and post-mortem inspections • Liquid and solid waste management and disposal • Food safety standards, including meat-borne diseases and risk of meat contamination • Management systems. *PPP model: Corporate processors-cum-exporters to conduct training under long-term service contracts, with GoS oversight.*	2						• At least 1,000 slaughterhouse workers trained per year (50 per year per location in over 20 locations)	DoLF	• *Taluka* Municipal Administrations • SEPA • SAU • SFA • PSQCA • Private sector • Sindh PPP Unit
		3.2.4. Based on a comprehensive needs assessment, upgrade livestock auction markets (*mandis*) throughout Sindh. The facilities should be equipped for basic animal welfare (e.g. availability of water and fodder, proper waste management, access to sheds and quarantine measures) to reduce the stress for animals, affecting the meat's quality. Mandis *could be operated through PPPs based on long-term management contracts, with GoS providing basic infrastructure and playing an oversight and regulatory role.*	1						• Needs assessment study completed by 2024 • All provincial *mandis* upgraded by 2027	DoLF	• Local governments • Transport and Mass Transit Department • National Logistics Cell • SEPA • PDD • SEDF • Sindh PPP Unit • SPPRA
		3.2.5. Establish distribution channels for vaccines and cattle AI with cold chain equipment: • Conduct a needs assessment to identify the specific cold chain equipment requirements • Develop a plan for procurement and distribution of cold chain equipment, including purchasing or leasing liquid nitrogen transportation and storage containers, refrigerator cold chain systems and other necessities • Establish a distribution network that includes the placement of cold chain equipment at key distribution points, such as veterinary offices, community health centres and livestock markets	1						• Efficient and effective distribution system established, ensuring access to vaccines and AI with cold chain equipment	Health Department	• PDD • DoLF • Transport and Mass Transit Department • Information, Science and Technology Department • Private sector

Strategic objective	Operational objective	Activity	Priority (1=Highest)	Period 2023	2024	2025	2026	2027	Targets	Leading implementing partner(s)	Supporting implementing partners
		• Train personnel responsible for handling and maintaining cold chain equipment.			■	■	■				
		3.2.6. Develop and publish PPP tenders for the conversion of manure (biomass) to biogas, including the following activities: • Collect and transport manure within a target area • Treat manure to produce biogas at a biogas production plant • Establish solar-powered manure separation units • Convert the biogas into compressed biogas • Market the residue of manure digestions – bioslurry – as a fertilizer • Provide a tax refund for large installations to produce fertilizer.	2		■	■	■		• At least 10 projects supported by 2027	Energy Department	• DoLF • Investment Department • Environment, Climate Change and Coastal Development Department • Irrigation Department • DoASP • Sindh PPP Unit • SPPRA • Private sector
		3.2.7. Introduce a renewable energy support scheme in the livestock sector through grants to support operators installing solar and wind energy systems and converting transportation fleets to biogas or electric / fuel hybrid. *The scheme could be included in the Sindh Solar Energy Project, managed by the Energy Department.* [17]	2		■	■	■		• At least 10 projects supported by 2027	Energy Department	• Finance Department • DoLF • Investment Department • Environment, Climate Change and Coastal Development Department • PDA • DCFA • Meat processors-cum-exporters association (to be established)
	3.3. Increase local value added and strengthen market links	3.3.1. Introduce a meat-processing equipment scheme to assist operators in replacing or acquiring new technologies and equipment to expand their operations (e.g. vacuum-packaging technology, patty-making machines, mincers, meat-cooking equipment, etc.). Equipment that generates less environmentally harmful emissions would be preferable.	1		■	■	■	■	• Scheme introduced • At least 10 projects supported per annum, starting in 2024	DoLF	• Meat processors-cum-exporters association (to be established)

[17] More information available from Sindh Solar Energy Project (n.d.).

Strategic objective	Operational objective	Activity	Priority (1=Highest)	Period 2023	2024	2025	2026	2027	Targets	Leading implementing partner(s)	Supporting implementing partners
		3.3.2. Develop and conduct practical modular training programmes for meat workers and professionals at meat-processing units on product development, advanced packaging and value added to meat and meat products (e.g. cooked meat and ready-to-eat and ready-to-cook products). *Corporate processors-cum-exporters to conduct training through a PPP model with a long-term services contract, with GoS oversight.*	1						• 1,500 meat workers trained in 2024 and up to 3,500 per annum by 2027	Private sector	• SAU • SBBUVAS
		3.3.3. Establish an e-commerce portal providing timely information on beef and mutton supply, demand, prices, quality requirements, production costs, regulations, emerging production, processing, packaging and logistics technologies. The portal can be developed by corporate processors-cum-exporters through a long-term management contract.	1						• Portal designed and operationalized	TDAP	• Private sector
		3.3.4. Establish and operationalize a national meat processors-cum-exporters association (with provincial branches) to defend the interests of private operators. The association will engage in public policy advocacy with and on behalf of its members.	1						• National and provincial meat processors-cum-exporters association established	Federation of Pakistan Chambers of Commerce and Industry	• TDAP • MNFSR • Ministry of Commerce • Directorate General of Trade Organizations • Meat processors-cum-exporters
		3.3.5. Create a coordination council to develop market links between corporate meat processors-cum-exporters and progressive individual farmers and farmers' groups.	2						• Coordination council created	TDAP	• Private sector

Annex 1: Complete list of participants in the public–private consultation

Participant name	Organization	Designation
Dr Abdul Manan Khokhar	DoLF	Deputy Director
Dr Abdullah Sethar	Livestock Breeding Service Authority, Sindh	Registrar
Dr Atta Hussain Shah	Faculty of Animal Husbandry and Veterinary Sciences, SAU	Associate Professor / Coordinator
Dr Ghayasuddin Shah	SAU	Dean
Dr Ghulam Muhammad Bhutto	Livestock Department, Hyderabad	Technical Officer
Dr Ghulam Sarwer	Japan International Cooperation Agency (JICA) Project Team on Sustainable Livestock Development for Rural Sindh	Livestock Project Director, Sindh
Dr Huma Rizwana	Department of Livestock Management, SAU	Associate Professor & Chair
Dr Iqbal Memon	Commissioner Office, Karachi	Commissioner Karachi
Dr Ishaque Ahmed Ansari	Bureau of Statistics	Director General
Dr M. Ameen Ansari	Commissioner Office, Sukkur	Additional Commissioner
Dr M. Ilyas	AQD, Karachi	Director
Dr Pershotam Khatri	Animal Reproduction, SAU	Professor and Chair
Dr Zahid Iqbal Rajput	SBBUVAS	Professor and Dean
Mr Ali Bux Soomro	PSQCA	Director Conformity
Mr Muhammad Ashraf Palari	PSQCA	Director Standards
Mr Muhammad Faisal Idrees	The Organic Meat Company Limited	Group Chief Financial Officer
Mr Tariq Butt	PK Meat & Food	Chair
Mr Muhammad Nadeem Qureshi	Meat Merchant Welfare Association	Chair
Mr Abdul Ahad	PDD, Livestock and Fisheries section	Chief Training Officer
Mr Ajaz Ahmed Mahesar	Agriculture Supply and Prices Department	Secretary
Mr Arsalan Sheikh	Butchers Welfare Association, Karachi	General Secretary
Mr Asad Baghpati	All Pakistan Livestock and Dairy Association	Representative
Mr Assad Zamin	PPP Unit, Finance Department	Director General
Mr Aurangzeb Jahangir	TDAP	Assistant manager
Mr Fahad Rabani	Feedlot farmer, Karachi	
Mr Ghulm Mustafa Phul	Commissioner Office, Sukkur	Commissioner Sukkur
Mr Hussain Ali Kalwar	Frieslandcampina Engro Pakistan Ltd	Head of Governmentt Relations and Corporate Affairs (South)
Mr Jamil Memon	Sindh Dairy livestock and breeding farm, Karachi	Chief Executive Officer
Mr Kamran Khalili	Al Shaheer Corporation Ltd.	Chief Executive Officer
Mr Khizar Pervaiz	SEDF	Chief Executive Officer
Mr Manzoor Ahmad Baloch	DG Agriculture Marketing Sindh	Director General
Mr Muhammad Sohail Memon	Hyderabad Chamber of Commerce	Member
Mr Sadaqat Hussain	Small and Medium Enterprise Development Authority	Manager Associate
Mr Shahid Waheed	A One Feed Mill	General Manager
Mr Syed Awais Ali	Breeding goat farm and fodder grower	
Mr Usman Naseer	Goat fattening farm	
Mr Younus Sandeela	FARMWELL (Pvt.) Limited	Chief Executive Officer
Ms Benazir Kanwal	SIAH	Deputy Director
Ms Noor Ahmed Baluch	SAU	Director General

Annex 2: List of laws and regulations applicable to the meat sector in Sindh

- Sindh Solid Waste Management Act, 2021
- Climate Change Policy, 2022
- Sindh Food Authority Act, 2016
- Agriculture Produce Market (Amendment) Act, 2019
- Sindh Wholesale Agricultural Produce Markets (Development and Regulation) Act, 2010
- Sindh Cattle (Contagious Diseases) Act, 1948
- Sindh Local Councils (Imposition, Assessment and Collection of Taxes) Rules, 1979
- Sindh Local Councils (Imposition, Assessment, Collection and Administration of Taxes, Rates, Tolls and Fees) Rules, 2016
- Sindh Institute of Animal Health Act, 2014
- The Sindh Women Agricultural Workers Act, 2019
- The Sindh Land Revenue Act, 1967 and its 2011 and 2019 Amendments
- Cattle Trespass Act, 1871

In addition, The Sindh Animal Feed Stuff and Compound Feed Act, 2022 is yet to be passed by the competent authority.

Annex 3: Initiatives supporting the development of the meat sector in Sindh

International organizations have launched several initiatives to support the livestock sector, including the meat industry, in partnership with DoLF. The current Meat SDS can leverage the achievements and experiences gained from these development programmes. Table presents some significant recent and ongoing initiatives.

Table A1: Recent initiatives supporting the development of the meat sector in Sindh

Name of project	Main features	Funding agency	Implementation period	Proportion of budget
Sindh Agriculture Growth Project (livestock component) (World Bank, n.d.; DoLF, n.d.)	To improve the productivity and market access of small and medium producers. • Capacity building of producers • Modernization of extension services and agricultural research, and strategic planning for the agricultural sector • Rehabilitation of veterinary units • Provision of livestock management training for farmers and training of DoLF staff	World Bank	2017–2021 (closed)	100% from World Bank as a loan
Project on Sustainable Livestock Development for Rural Sindh, a research-based pilot project (JICA, 2011)	• Development of appropriate (easy to adopt) technologies • Capacity building of DoLF and livestock farmers • Calf salvation	JICA GoS	2014–2021 (closed)	79% JICA 21% GoS
FAO–Pakistan Smart Water Management (FAO, 2018)	• Strengthening the government's capacity to support farmer communities to adapt to climate change • Building farmers' resilience against climate change through skills, knowledge and technology (about 200,000 rural households in eight districts of Punjab and Sindh) • Creating a more enabling environment for continuous adaptation and expanded sustainable uptake of climate-resilient approaches	Six-year period (currently in its final design stage)	Green Climate Fund signed this project with FAO and granted $35 million	Total cost: $47.69 million with co-financing from both provinces

Source: Ministry of Finance (2021).

At the national level, MNFSR, with its redefined role under the Eighteenth Constitutional Amendment, undertook the following measures pertaining to the meat sector:

- Import of high-yielding dairy cattle breeds, Holstein Friesian and Jersey, for enhanced milk production
- Semen and embryos of high-yielding animals for the genetic improvement of indigenous low-producing animals
- Import of high-quality feedstuff / micro ingredients to improve the nutritional quality of animal feed.

National *Peste Des Petits Ruminants* Eradication Programme: Under this PKR 1.8 billion project, efforts will be made to move Pakistan into Stage 3 of the progressive step-wise approach of OIE eradication of this disease in the next five years. This will be achieved by maintaining an efficient surveillance system through better coordination between different laboratories and the use of biomolecular techniques for the epidemiology of *peste des petits ruminants* in Pakistan (Ministry of Finance, 2021).

Ehsaas Amdan (Income) Programme: Launched by the Prime Minister in 2020, this PKR 15 billion programme involves giving small assets, mostly livestock (goats, cows, buffaloes and poultry), to those who live below the poverty line in 375 rural union councils of the 23 poorest districts across the four provinces of Pakistan. In Sindh, the programme districts include Badin, Thatta, Sujawal, Kashmore, Shikarpur, Tharparkar and Umerkot. The four-year programme has a target of providing around 200,000 assets to households in need (60% women and 30% youth beneficiaries). In total, it will benefit a population of 1.4 million across the country (Ministry of Finance, 2021).

Support Development and Piloting Pakistan Animal Identification and Traceability System: This project is under execution with the technical and financial support of FAO-Pakistan. Pakistan currently does not have a reliable animal identification and traceability system to manage livestock identification and movements in the country. The lack of such a system poses significant challenges for Pakistan, specifically in the export of livestock and their products, in the wake of limited resources and the capacity of animal health services to deliver effective animal health programmes. The project will be used as pilot demonstrations in cattle and buffalo herds in limited geographic regions, smallholder livestock farms and selected feedlot-fattening dairy farms.

Enhancement of FMD Control Programme in Pakistan: This project is under execution in collaboration with the Government of Pakistan, JICA and FAO-Pakistan, with the following objectives:

- Reporting of FMD outbreaks by stakeholders (veterinarians, veterinary assistants and dairy farmers)
- Awareness of dairy farmers
- Rapid response to FMD outbreaks.

Annex 4: Trade and investment support institutions involved in the development of the red meat sector in Sindh

Table A2: Trade and investment support institutions involved in the development of the red meat sector in Sindh

Name of institution	Role / responsibilities
Policy and regulatory support institutions	
Federal-level institutions	
MNFSR	MNFSR is responsible for developing policies and strategies related to food security, agriculture and livestock in Pakistan, and for regulating and coordinating the activities of various government departments, research organizations and private sector entities involved in these sectors.
AQD	AQD is responsible for inspecting all live animals, animal products and animal by-products that are imported into or exported from Pakistan, ensuring that these items meet the required health and safety standards. AQD then issues import and export permits accordingly. AQD operates quarantine facilities at key entry and exit ports, conducts disease surveillance and monitoring programmes, and issues health certificates.
Other important institutions include: • **National Database and Registration Authority** • **National Animal and Plant Health Inspection Service**	
Provincial-level institutions	
Provincial Assembly of Sindh	Plays a critical role in the development of the livestock sector in Sindh by formulating policies, allocating resources, providing oversight, advocating for stakeholders and raising awareness among the public about the importance of the sector.
Law, Parliamentary Affairs and Criminal Prosecution Department	Primarily responsible for providing legal support and advice to GoS. It can play a vital role in creating and implementing legislation and regulations related to livestock, animal welfare, food safety and other related areas and ensures that the legal framework for the livestock sector is comprehensive and effective.
Local government bodies (i.e. *taluka* / *tehsil* municipal administration / town municipal administration, metropolitan corporations and other zonal corporations)	Regulate and manage livestock markets, slaughterhouses and animal health services in their respective jurisdictional areas and ensure that the meat produced is safe for consumption. The town municipal administration also regulates the disposal of animal waste.
DoLF	Plays a crucial role in promoting the development of the livestock and dairy sectors in Sindh. It works to improve animal health, livestock productivity and milk quality, and provides training and support services to farmers and other stakeholders in these sectors.
Agriculture, Supply and Prices Department	Plays an important role in the livestock sector by developing policies and programmes, providing technical assistance and training, promoting market development, regulating prices and ensuring food security.
Transport and Mass Transit Department	Facilitates and regulates the transportation of livestock and livestock products within and outside Sindh.
Industries and Commerce Department	Responsible for promoting industrial development and facilitating commerce in Sindh. It plays an important role in promoting agro-based industries that use livestock products as raw materials.
SFA	Responsible for ensuring that the food and beverages consumed by the public in Sindh are safe and meet the required standards, notably through inspections of food processing and manufacturing facilities.
Health Department	Plays a critical role in safeguarding public health in Sindh by ensuring the safety and quality of animal products, preventing the spread of animal diseases and promoting good animal husbandry practices.
Women Development Department	Responsible for promoting gender equality and the empowerment of women in Sindh. The Department can promote women's participation in the sector, providing them with training and support, and advocating for policies that address their specific needs and priorities.

SEPA	The agency regulates industries and activities that have the potential to cause environmental pollution in Sindh; monitors environmental quality; conducts environmental education and awareness programmes; conducts environmental impact assessments; and provides technical support for environmental policy formulation.
PDD	Responsible for planning and coordinating development programmes and projects in Sindh. It formulates development plans, mobilizes resources, appraises and evaluates projects, formulates policies, and coordinates with other stakeholders to promote development in the province.
Finance Department	Responsible for managing the financial resources of Sindh. It prepares and executes the provincial budget, manages government debt and financial records, collects revenue, engages in financial planning, manages the provincial treasury and prepares financial reports.
Sindh Board of Revenue	Responsible for the collection of revenue and taxes, and the management of land and property records.
Sindh Bureau of Statistics	Responsible for collecting, analysing and disseminating statistical data related to the livestock sector (mainly collected from DoLF).
Sindh PPP Unit	Responsible for promoting and facilitating PPPs to improve service delivery and support economic growth in Sindh. This can include partnerships to develop and upgrade livestock facilities, such as breeding farms, feed mills and slaughterhouses, among others.
SPPRA	Establishes rules, regulations and procedures for procurement, provides guidance to procuring agencies, evaluates bids and proposals, and monitors procurement practices to ensure compliance with procurement laws and regulations.
Other important institutions include: • **Irrigation Department** • **Energy Department** • **Environment, Climate Change and Coastal Development Department** •	
Trade support institutions	
Federal-level institutions	
TDAP	Identifies potential markets, provides capacity-building support, shapes trade policy, organizes trade fairs and exhibitions, and promotes investment.
PSQCA	Introduces, regulates and enforces uniform quality standards across Pakistan.
Federation of Pakistan Chambers of Commerce and Industry	Represents the interests of the business community in Pakistan. As a non-profit organization, it advocates for policies and programmes that promote economic growth, conducts research and analysis, provides a platform for networking and business promotion, offers support for capacity building and promotes international trade.
Karachi Port Trust	Responsible for managing and operating the Karachi Port.
Other important institutions include: • **National Logistics Cell** • **Federal Board of Revenue**	
Provincial-level institutions	
Karachi Chamber of Commerce and Industry, Hyderabad Chamber of Commerce and Industry, and other chambers of commerce and industry	Non-profit organizations representing the interests of businesses in their respective areas and serving as a platform for businesses to interact with the government, exchange information and participate in policy discussions.
All Pakistan Meat Exporters and Processors Association	The representative body of the meat-processing and export industry in Pakistan. It advocates for the interests of its members, promotes export markets, ensures compliance with quality standards, provides training and technical assistance, and provides networking opportunities. ***Note:*** The Association is not registered and, therefore, not authorized to represent the meat industry.
Business support institutions	
Federal-level institutions	

Small and Medium Enterprise Development Authority	Responsible for promoting and developing small and medium-sized enterprises in Pakistan. This government organization provides a range of business development services, advocates for policy reforms, promotes cluster development, helps small and medium-sized enterprises to upgrade their technology and provides access to finance.
Pakistan Agricultural Research Council, MNFSR	Plays a critical role in researching various aspects of agriculture, including promoting breeding technologies, with the scope to breed superior-quality cattle.
DCFA	Primarily represents dairy and cattle farmers in Pakistan. It advocates for the interests of its members, provides training and technical assistance, helps members market their products, ensures compliance with quality standards and provides networking opportunities.
PDA	Represents the dairy industry in Pakistan. Its members include individual farmers, farmer organizations and companies involved in milk processing and dairy product manufacturing. It advocates for the interests of its members, provides training and technical assistance, helps members market their products, ensures compliance with quality standards and provides networking opportunities.
All Pakistan Jamiat Ul Quresh Meat Welfare Association	Represents the interests of Qureshi meat traders and butchers in Pakistan, mostly for the unregulated sector. It advocates for the interests of Qureshi meat traders and butchers, promotes animal welfare, and provides support and guidance to its members, in particular ensuring compliance with quality standards.
Other important institutions include: • **State Bank of Pakistan** • **Agricultural Development Bank of Pakistan** • **Zarai Taraqiati Bank Limited and other commercial banks**	
Provincial-level institutions	
Investment Department	Plays a critical role in promoting investment and creating an enabling environment for the overall economic development of Sindh.
Sindh Board of Investment	Responsible for promoting and facilitating investment in Sindh. The Board provides information and guidance to investors, facilitates investment, develops infrastructure and advocates for policies that support growth.
Sindh Abadgar Board	Represents farmers in Sindh and is primarily responsible for safeguarding farmers' interests and promoting agricultural development in Sindh, notably through advocacy and representation, capacity building, marketing and price support.
Sindh Chamber of Agriculture	Advocates for policies and initiatives that promote the growth and sustainability of the livestock industry and provides a platform for farmers, breeders, traders, and other stakeholders in the sector to voice their concerns and seek solutions to the challenges they face.
SEDF	Provides technical and financial assistance to promote opportunities in agriculture value chains, including dairy and livestock farming.
Breeder associations (Sindh Cattle Farmers Association, Sindh Buffalo Breeders Association, Sindh Sheep and Goat Breeders Association, Sindh Indigenous Livestock Breeders Association)	Promote the breeding and genetic improvement of livestock. The primary role of breeder associations is to improve the quality and productivity of livestock by providing guidance, technical assistance and training to livestock farmers.
Other important institutions include: • **Information, Science and Technology Department, Sindh**	
Academia and civil society networks	
SAU, Faculty of Animal Husbandry and Veterinary Sciences	Provides education and training, conducts research, provides outreach and extension services, collaborates with other institutions and stakeholders, and facilitates technology transfer to farmers.
SBBUVAS	Public-sector university that provides education and training, conducts research, provides advisory services, collaborates with other institutions and stakeholders, and promotes entrepreneurship.
PCSIR, Ministry of Science and Technology	Conducts R&D activities in the livestock sector (including animal health, nutrition and breeding), provides technical support through the provision of technical advice, training and capacity building, and provides quality assurance services, including testing of animal feed and animal-based products.

SIAH, DoLF	Provides diagnostic, research and advisory services related to animal health, and is responsible for conducting disease surveillance and monitoring and controlling animal diseases to safeguard the health and welfare of animals. SIAH is also responsible for regulating the import and export of animals and animal products, and provides training programmes on animal health management for veterinarians, animal health workers and livestock farmers.
National Veterinary Laboratory, MNFSR	Provides diagnosis of animal diseases, conducts disease surveillance to monitor the prevalence of animal diseases in Pakistan, conducts R&D activities to develop new diagnostic techniques, vaccines and treatment strategies for animal diseases, and provides capacity-building programmes for veterinarians and laboratory staff.

Other important institutions include:

- **Department of Food Science and Technology, University of Karachi**
- **Sindh Industrial Analytical Centre**
- **International Centre for Chemical and Biological Sciences, University of Karachi**

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