

Balochistan Livestock Breeding Policy 2022

Policy and Action Plan (ITC-UN Version)

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About the Report

It was a great experience for me to work with the International Trade Centre (ITC-UB) as a National Consultant for developing the "Balochistan Livestock Breeding Policy 2022." It was an opportunity for me to utilize my knowledge, skills, and experience gained over 39 years in the public sector and visible interaction with the private sector, for transformation of the livestock resource-base of Balochistan into prosperity of the people.

As per the agreed Terms of Reference, a literature review was conducted as Output 1, including analysis of existing policies, laws, and regulations and the status of livestock breeding services, food safety, and standards. Based on the review, an issue paper was developed, identifying issues in the following three categories: (i) Livestock Breeding; (ii) Lack of Good Governance; (iii) Challenges to the Private Sector.

The consultant interacted with stakeholders in the public and private sectors for Output 2, with a primary focus on providing a Good Governance Model (GGM) of the Academia-Industry-Government Nexus (AIGN). In order to assess their current and potential roles in policy-related issues, nine public-sector organizations were consulted, including the Livestock, Forest, Local Government, and Industries departments, and four universities (i.e., UOB, BUIITEMS, SBKWU, and LUAWM), for the integration of academic wisdom and resources into the Policy. Quetta Chamber of Commerce and Industry was engaged for integrating the real stakeholders from the private sector. Based upon the consultation, recommendations were made for engaging the relevant public sector organizations in the integrated development strategy of this policy.

The policy was split into seven thematic areas: Genetic Resource-base Improvement; Sheep and Goats; Camels; Poultry; Cattle and Buffaloes; Reproductive Management of Animals; and Rangeland Management. Policy Sections were produced as Farming to Entrepreneurship; Farmers' and Processors' Empowerment; Integrating SDGs; Establishing Endowment Fund; Establishing Functional Units; Introducing Good Governance Model - Departmental to Integrated Approach; and Establishing Livestock Technopark Quetta.

An Action Plan and Implementing Strategy were suggested involving various participating organizations to deliver meaningful services to the community focused on entrepreneurship development for generating decent employment and exportable surpluses in line with SDGs 2, 3, 5, 7, 8, and 16.

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For more information on Good Governance across Livestock Value Chain, see: link <https://dairysciencepark.org/gg/>

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Foreword

Balochistan is Pakistan's southwestern province, the largest in area but the smallest in population, with Quetta as its capital and most populous city. The total area of the province is 34 million ha, of which only 4% is cultivated, and 60% of the cultivated area is rainfed. The rangelands make up about 93 percent of the province. The ranges in Balochistan have been a source of livestock forages, wildlife habitat, medicinal plants, water storage, and distribution. These ranges also provide energy, minerals, fuel wood, recreational facilities, and a natural landscape.

Balochistan is rich in natural resources and provides some of the best assets for developmental interventions, as reported by the World Bank in 2008. The vast rangelands support the farming of goats, sheep, buffaloes, cattle, camels, and other livestock. Its southern border makes up about two-thirds of Pakistan's coastline, giving access to a large pool of fishery resources. This frontier province provides a trade opportunity with the neighbouring countries, resulting in historical and cultural linkages. The province has been supplying cheap natural gas to the rest of the country, supporting industrialization. Although it has a huge natural resource base, the economy of Balochistan has not done well.

The livestock population of the province contributes 52.0%, 41.0%, 22.0%, 12.7%, 11.0%, and 2.6% of Pakistan's sheep, camels, goats, pack animals, cattle, and buffaloes, respectively. These animals provide a source of employment to about 66% of households in the province in the arid regions, which are unsuitable for cultivating crops. The rising living standards of the people and the rapid urbanisation of the province have resulted in increasing demands for milk and meat products. LDD has been providing services to the farmers, and BRSP has been supporting livestock farmers through a network in 25 districts. However, the commercial aspect of this resource-base is still unexplored, and the poverty level in the province is high.

This Consultant was enthusiastic about providing services for the transformation of the livestock sector from farming into an entrepreneurship base to generate decent employment and exportable foods and biotech products across the livestock breeding value chain (LBVC) under the Balochistan Livestock Breeding Policy 2022 and Action Plan.

Presently, LBVC is provided services officially and mainly by the Director General Animal Health with a handsome current budget of Rs. 4.53 billion and a development budget of Rs. 1.63 billion. Looking at the SNE for 2022, it appears that the farmers are served by the regular staff stationed at civil veterinary hospitals and dispensaries, livestock farms, SPUs, dairy and poultry farms, etc. The department is protecting animal health and productivity to some extent, while the entrepreneurial aspect is totally lacking.

Management of the LBVC by the Directorate General Animal Health may be supplemented with inputs from Public Service Organizations (PSOs) through an autonomous Livestock Technopark Quetta (LTQ), an Academia-Industry-Government Nexus, a Triple Helix Model of Good Governance with legislative, regulatory, financial, and administrative powers, to boost entrepreneurship development, regulating and facilitating all the Functional Units at PSOs. An endowment fund (EF) may replace the repeated funding to remove the financial burden on the government treasury.

Nine PSOs would work in coordination to achieve the common goal of transforming the provincial livestock resources into prosperity for the people. These resources would be utilised for generating decent employment and quality products that are certified, traceable, and hygienic. Halal foods and biotech products for local and export markets would be produced through an interconnected network of entrepreneurial models covering livestock and poultry farming, dairy and meat factories, diagnostic, clinical, and consultancy centres, and marketing facilities.

Acknowledgements

This Consultant acknowledges the International Trade Centre for providing him an opportunity to contribute to reducing the hardships faced by the people of Balochistan in getting benefits from the natural resources available in the form of sheep, camels, goats, poultry, and cattle. The support of ITC in the internationalisation of micro, small, and medium enterprises (MSMEs) is commendable. This Consultant endorses the ITC's focus on reducing poverty through the development of rural MSMEs in selected districts of Balochistan under the EU-funded "Growth for Rural Advancement and Sustainable Progress" (GRASP) project, which aims to contribute to the product lines within livestock and horticulture. The support of Mr Qasim Choudhry, Mr Jahanzeb Khan, Mr Habibullah Khan Nasir, and Ms Talha Baloch enabled me to complete this task.

Mr Arshad Hussain Bugti, Secretary Livestock and Dairy Development, Government of Balochistan, kindly advised the staff to facilitate this mission. Director General Ghulam Rasool Taj, Director General Kamran Akhtar, Director Research Shahzad Ahmad, and other senior officers discussed the prevailing issues and possible solutions and organised our visits to the semen production unit, the liquid nitrogen plant, and other facilities. Dr Zafar Ahmad, Director CASVAB, and Dr Muzammil Bukhari, Director ORIC, organised a discussion with the relevant staff and experts. Dr Azam Kakar contributed valuable inputs into the process. Mr Altaf Gujar, Mr Abdul Basit of the Dairy and Cattle Farmers Association Balochistan, and Dr Ghazan Khan, Deputy Director LDD, arranged our visits to peri-urban dairy farms near Quetta and our discussion on the Policy items.

Secretary Forest and Wildlife Department very kindly extended his support to the Policy and allowed Mr Ghulam Muhammad, Chief Conservator Forest, to serve as Focal Point. Mr Ali Imran, Conservator of Forests, highlighted the importance of the Range Regulatory Authority, established under an Act of the Provincial Assembly. The policy suggests the establishment of an LEDC at their Turbat facility. Support of the Secretary Local Government Department is acknowledged who allowed Mr Jabbar Baloch Administrator Quetta Municipal Corporation as Focal Point. The facility at Mashriqi Bypass was allowed to be utilised as a marketplace supporting the policy objectives. The policy was supported by the Secretary Industries Department, and Mr Akhtar Langov, Director Small Industries, served as the policy's focal point for input and implementation.

Prof Nazir Ahmad, Dean FLS and Dr Allah Dad Shah, Deputy Director ORIC BUITEMS coordinated our discussion and visits at the main campus. Dr Ayesha Gul, Director ORIC and Dr Zubia Masood facilitated our visit to SBK Women University and discussion led by Vice Chancellor Prof Sajida Noureen. Prof Nasrullah Bangulzai and Prof Ilahi Bakhsh Marghazani arranged a zoom meeting with the Vice Chancellor, Prof Dr Dost Muhammad Baloch and other senior faculty. All the three universities agreed on hosting LEDC/HMEC/CEBEL at their main and sub-campuses.

The support of Mr Jumma Khan Badezai, Quetta Chamber of Commerce and Industry (QCCI), is highly acknowledged. He chaired a meeting at QCCI with private and public sector stakeholders for BLBP Policy 2022, which was attended by the executive member of QCCI, representatives of the Balochistan Dairy Farmers Association, the Beef and Mutton Association, farm input suppliers, the Pakistan Dairy and Cattle Farmers Association, the Balochistan Women Business Association (BWBA), and the government departments of LDD, Environment, Environment Protection Agency, SMEDA, and ITC-GRASP. Mr Shakoor Ahmad, Provincial Chief SMEDA, played an active role in the consultation process.

Prof Dr Shafiq ur Rahman, Vice Chancellor, University of Balochistan, chaired the final meeting after consultation with the stakeholders and endorsed the concept of the academia-industry-government nexus as a good governance model for engaging the educated youth in entrepreneurship development across the LBVC. He very kindly agreed to host the Livestock Technopark Quetta along with its CEGAPH at the main campus and LEDC at their Kharan Campus.

Lastly, let me thank my family members for supporting my mission. Irfan ul Haq Qureshi helped me in documenting the consultative process and arranging logistical support for my travel from Peshawar to Quetta and back. My kids, Eman Gul, Manha Gul and Zaland Gul, eagerly awaited my return from work.

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Acronyms

ADP	Annual Development Program
AI	Artificial Insemination
AICs	Artificial Insemination Centres
AIGN	Academia-Industry-Government Nexus
BRRC	Balochistan Regulatory Reforms Committee
BUIITEMS	Balochistan University of IT, Engineering and Management Sciences
BWBA	Balochistan Women Business Association
CAH	Centre for Animal Health
CASVAB	Centre for Advanced Studies in Vaccinology and Biotechnology
CEBEL	Centre of Excellence for Biology and Entrepreneurship of Livestock
CEGAPH	Centre of Excellence for Genetics of Animal Production and Health
CVHs	Civil Veterinary Hospitals
DCFA	Dairy and Cattle Farmers Association Pakistan
DSP	Dairy Science Park
EF	Endowment Fund
EGABR	Expert Group on Animal Breeding and Reproduction
EMTS	E-marketing and technical services
FAO	Food and Agriculture Organization
FUs	Functional Units of Livestock Technopark Quetta
GRASP	Growth for Rural Advancement and Sustainable Progress
HHP	Herd Health Program
HMREC	Halal Meat Research and Entrepreneurship Centre
ITC	International Trade Centre
LBVC	Livestock breeding value chain
LDD	Livestock and Dairy Development Department
LEDC	Livestock Entrepreneurship Development Centre
LFA	Livestock Farmers Association
LG	Department of Local Government
LSRSC	Livestock SMEs Regulatory Support Cell
LSSC	Livestock SMEs Support Cell
LT	Livestock Technopark
LTQ	Livestock Technopark Quetta
LUAWMS	Lasbela University of Agriculture, Water and Marine Sciences
MFMDf	Model farms and meat and dairy factories
NLDG	Non-lapsable Development Grants
ONBS	Open Nucleus Breeding System
PCC	Price Control Committee
PPP	Public-Private Partnership
PRFP	Postpartum rebreeding and feeding plan
PSDP	Public Sector Development Program
PSOs	Public Sector Organizations
QCCI	Quetta Chamber of Commerce and Industry
SBKWU	Sardar Bahadur Khan Women's University
SF	Salvage farming
SMEDA	Small and Medium Enterprises Development Authority
SMEs	Small and Medium Enterprises
SPU	Semen Production Unit
UN	United Nations
WTO	World Trade Organization

Executive Summary

It was a great experience for the National Consultant to work with the International Trade Centre (ITC), a joint agency of the World Trade Organization (WTO) and the United Nations (UN), as National Consultant for developing the “Balochistan Livestock Breeding Policy 2022” (BLBP-2022). It was an opportunity for me to utilise my knowledge, skills and experience prevailing over a period of 39 years, at the provincial government of Khyber Pakhtunkhwa, the University of Agriculture, Peshawar, Pakistan, and Charles Sturt University, New South Wales, Australia.

As per the agreed Terms of Reference, a literature review was conducted as Output 1, including analysis of existing policies, laws, and regulations, and the status of livestock breeding services, food safety, and standards. Based on the review, an issue paper was developed identifying issues under the following three categories: (i) Livestock Breeding; (ii) Lack of Good Governance; (iii) Challenges to the Private Sector. For Output 2, the Consultant travelled to Quetta for interaction with the stakeholders in the public and private sectors.

Consultations were made at 9 public sector organizations (PSOs), including the Livestock, Forest, Local Government and Industries Departments for assessing their current and potential roles in the Policy related issues; the University of Balochistan, Balochistan University of Information Technology, Engineering and Management Sciences (BUITEMS), Sardar Bahadur Khan Women's University (SBKWU), and Lasbela University of Agriculture, Water and Marine Sciences (LUAWMS) for integration of academic wisdom to the Policy; and the Quetta Chamber of Commerce and Industry (QCCI) for engaging the real stakeholders affected by the Policy, i.e. the livestock farmers, products processors, marketing bodies and practicing veterinarians working with the private sector. A Good Governance Model (GGM) of Academia-Industry-Government Nexus (AIGN) was proposed. Separate Functional Units (FUs) were proposed for each of the nine PSOs to participate in the implementation strategy of this Policy.

The existing livestock breeding policy in practice in the country is not relevant to Balochistan, as it reflects a stereotyped approach focusing on dairy production through cattle and buffaloes. These animals need a large amount of feed, fodders, water and market access on a daily basis which are not available in Balochistan, a mostly arid or hilly region, contributing 55.3% of the national rangeland of 57.2 million hectares (Mha). Hence, the province can support meat production through sheep, goats, camel, and cattle farming, contributing 52%, 22%, 41%, and 11% of the national population, respectively (GOP 2006). Poultry was covered as an additional entrepreneurship asset.

This Policy has focused on enhancing the genetic and reproductive potential of indigenous livestock breeds, growth rates, and onset of puberty, health and productivity of animals through better rangeland management, feeding, housing, value addition, quality control, traceability and marketing backup. Economic traits like growth rates, fertility, productivity and disease and stress resistance may be used as indicators for genetic improvement. Entrepreneurship development support would be provided through an integrated approach by the sister organizations. Concerns of all the relevant stakeholders were accommodated through sharing the available trained manpower, land and financial resources available at various PSOs.

Breeding goals have been set like improving the quality of breeds rather than number of animals; earlier puberty and breeding; enhancing growth rates of young ones; improving semen quality and embryo transfer; establishing reproductive biotechnologies; improving reproductive efficiency of males and females; improving feeding, health and management status of genetically-improved animals; establishing nuclear stocks for sheep, goats, camels and poultry; conservation of endangered livestock breeds; addressing issues of breeding farmers through an advocacy forum; assessing zonal requirements and preparing work plans in consultation with local stakeholders; and developing and demonstrating entrepreneurship models for meat, milk, wool and poultry production.

Several thematic areas have been identified under this Policy. Improvement of genetic resources would be ensured through development of breeding standards and selection criteria for males and females and selecting future stock on the basis of productivity, health and economic and meat traits. Sheep and goats will be improved through selection among the local breeds, numerically the more important ones and investigating the local breeds for their potential to be upgraded through crossbreeding with local or exotic

breeds. For camels, a cooperative setup will be provided for the local herds and studies will be conducted on breeding, management, nutrition, performance and reproductive behaviour of this animal.

Conservation of local cattle and buffaloes will be ensured for meat and milk purposes; selective breeding will be made on the basis of health and economic traits; and the indigenous cattle will be crossbred with semen from exotic breeds. Private farmers, veterinary practitioners and postgraduate university students would be involved in development of AI protocols for indigenous breeds. Demo farms, nuclear stocks and SPUs will be developed. Productivity of backyard poultry flocks will be enhanced through establishment of elite indigenous nuclear flocks at zonal levels in the province.

Reproductive management of animals would be ensured through training, research and extension services overcoming delayed or repeat breeding and poor growth rates of the young ones in various species of ruminants and camels. Research facilities would be established in relevant research and academic organizations in reproductive biotechnologies like semen quality, embryo transfer, cloning, semen sexing, transgenesis and other emerging technologies. The key threats to rangeland were identified as the increased number of livestock beyond the carrying capacity, improper land use and mismanagement. Prevention of the degradation process and establishment of check or delayed action dams are recommended. Indigenous knowledge must be utilised, involving local communities and traditions.

This document has been split into seven Policy Sections. Development of SMEs may be facilitated for milk, meat, wool and biotech products. A system would be introduced for the traceability and quality control certification of animals and animal products, which are mandatory for export of animal products across the country and international market. The price capping would be either removed through legislation at provincial and federal levels, or assigned to the proposed technopark, representing all the stakeholders.

Various categories of farmers, processors and potential entrepreneurs would be organised into registered societies and involved in legislation, planning and development at various levels. It will be an interactive platform for achieving SDGs 2, 3, 5, 7, 8 and 16. An Endowment Fund (EF) would be established through provincial, federal and donor grants for developing entrepreneurship models. The private sector would offer their land, animals, building and other assets for a period of at least five years with investment by the proposed technopark and operational arrangements by the private partner.

The proposed Livestock Entrepreneurship Development Centres (LEDC) would be established at nine locations and run as public-private partnership (PPP)-based joint ventures through local committees under an EF to provide farmers with access to farm inputs, product sale, products processing, training and regulatory support. The Centres would offer resources for establishing model farming, milk and meat shops, products processing factories, diagnostic labs and marketing facilities.

Centre of Excellence for Genetics of Animal Production and Health (CEGAPH) would be established in northern Balochistan and Centre of Excellence for Biology and Entrepreneurship of Livestock (CEBEL) in southern Balochistan. CEGAPH will work on identification of genetic markers for various survival and economic traits and stress resistance and will study health, productive, reproductive and nutritional parameters of genetically improved breeds. CECEL will integrate the biological knowledge of animal health, management, nutrition, breeding and reproduction with the entrepreneurship development potential across the livestock breeding value chain (LBVC).

Herd Health Program (HHP) teams would be constituted, engaging the qualified staff of the Livestock Department and university graduates, to support the farmers in improving health, breeding and reproductive efficiency; to improve products quality; and to reduce the per unit productivity cost through improved practices. Entrepreneurship models would be developed, engaging the postgraduate students at the proposed LEDCs jointly by the farmers, processors, universities and government officials through business incubation. Hygienic and Halal quality and traceability standards would be integrated into LBVC by the affiliated Centres of Excellence and Analytical Labs. Successful models would be selected as startups and university graduates would be sponsored to establish private companies for generating decent employment.

Presently, LBVC is provided services, mainly, by the Director General Animal Health with a current budget of Rs. 4.53 billion under BC21028 (28) Animal Husbandry, and development budget of Rs. 1.63 billion under 042106 Animal husbandry, as per official online resource-base. Looking at the schedule for new expenditure

for 2022, it appears that the farmers are served by the regular staff stationed at Civil Veterinary Hospitals and Dispensaries, Livestock Farms, SPUs, Livestock, Dairy and Poultry Farms, etc.

Working in remote areas of the province outside their stations is a challenge for the staff. They have limited resources to reach the scattered herds of sheep, goats, camels and cattle. Out of the 1200+ qualified veterinarians working in the Department, the Consultant could encounter only one, during my field visits and meetings with the private sector stakeholders at the Quetta Chamber of Commerce and Industry. The proposed HHP teams would provide technical services and material supplies to the private farmers with in-built incentive-package for the staff and with no need for repeated fundings.

Most of the state land available with partners PSOs has remained underdeveloped which may be utilised by local investors on profit-sharing basis and public-private partnership (PPP) for rearing dry animals and surplus calves of the peri urban dairy farms. The ultimate goal of this Policy is to serve LBVC through an integrated approach of the PSOs, removing the bottleneck at production, processing and marketing levels and utilizing these resources for bringing prosperity in the region.

A GGM has been suggested to overcome the challenges to the private sector, impeding entrepreneurship development across LBVC. Management of the LBVC by the Directorate General Animal Health may be supplemented with inputs from nine PSOs through the proposed autonomous body (livestock technopark) with legislative, regulatory, financial and administrative powers, to boost entrepreneurship development. An endowment fund (EF) may replace the repeated funding to remove the financial burden on the government treasury. Additional resources and regulatory support will be provided to the PSOs under an EF. Financial and career incentives may be provided to best performers.

An Action Plan and Implementation Strategy was prepared comprising: (i) Policy Shift; (ii) HHP; (iii) Breeding services; (iv) Postpartum rebreeding and feeding plan; (v) Development of Livestock Farms; (vi) Feeds Entrepreneurship Model; (vii) Sheep, goats and poultry entrepreneurship models; (viii) LEDCs; (ix) Engagement of relevant PSOs; (x) good governance; (xi) Livestock Technopark Quetta (LTQ); (xii) PSOs support; (xiii) SMEs Support Cells; (xiv) COEs; (xv) Entrepreneurship network; and (xvi) Expected outcome.

The integrated model of LTQ would be an autonomous regulatory, financial and administrative authority supported by a non-lapsable development grant (Rs. 1.28 b) and an EF (Rs. 1.72 b). The nine partner PSOs agreed on the proposal during the consultative process. Livestock breeding resources of the province would be utilised for generating decent employment (27500), quality certified and halal meat (4.5 million kg) and biotech products (US\$ 1 million) on an annual basis.

CHAPTER 1 POLICY DIRECTIONS AND BREEDING GOALS

Policy Directions

- The existing livestock breeding policy in practice in the country is not relevant to Balochistan as it reflects a stereotyped approach focusing on Dairy Production, based upon development of cattle and buffaloes. These animals need a large amount of feed, fodders, water and market access on a daily basis which are not available in Balochistan, a mostly arid or hilly region contributing 55.3% of the national rangeland of 57.2 Mha.
- Hence, the province can support meat production through sheep, goats, camel and cattle, contributing 52, 22, 41 and 11% of the national population. Livestock Resource-base has been given under Figure 1. Quality of these breeds may be improved through selective and crossbreeding using natural service or artificial insemination. Economic traits like growth rates, fertility, productivity and disease and stress resistance may be used as indicators for genetic improvement.
- The products like meat, milk, eggs and wool may be value added backed up with cold storage and marketing at local, national and international levels.
- Enabling environment may be provided through academia- industry- government linkages for creating entrepreneurship models across LBVC.

Breeding Goals

- Improving the quality of breeds rather than number of animals
- Earlier puberty and breeding; enhancing growth rates of young ones
- Improving semen quality; establishing reproductive biotechnologies
- Improving reproductive efficiency of males and females
- Improving feeding, health and management status of genetically improved animals
- Establishing nuclear stocks for sheep, goats, camels and poultry; conservation of endangered livestock breeds
- Addressing issues of breeding farmers through advocacy forum
- Assessing zonal requirements and preparing work plans in consultation with local stakeholders
- Developing and demonstrating entrepreneurship models for meat, milk, wool and poultry production

CHAPTER 2 BALOCHISTAN BREEDING POLICY 2022

2.1 Thematic Areas

Policy Thematic Area 1: Genetic Resource-base Improvement

- Developing breeding standards and selection criteria for male and female animals
- Selecting future stock on the basis of productivity, health and economic and meat traits; selecting sites among top 10% animals of various breeds at government farms
- Investigations on economic potential of local livestock breeds and poultry varieties and introduction of exotic breeds
- Identification of genetic markers for various survival and economic traits and stress resistance
- Studies on health, productive, reproductive and nutritional parameters of genetically improved breeds
- Zonal requirements for various livestock breeds; using Jersey semen in areas with fodders and water scarcity and HF semen the otherwise
- Issues of livestock breeding farmers and other relevant stakeholders
- Development of Data Bank and gene banks for various livestock breeds and endangered breeds

Policy Thematic Area 2: Sheep and Goats

- Evaluation of the local breeds of sheep and goats, numerically the more important ones, for producing meat, milk and wool
- Investigating the local breeds for their potential to be upgraded through crossbreeding with local or exotic breeds directed at enhanced meat, milk and wool production
- Improving the local sheep and goats breeds through selection on the basis of body weight gain and feed conversion efficiency
- Crossbreeding the indigenous sheep and goats with exotic mutton breeds for improved meat production under intensive management
- Genetic improvement of indigenous sheep having lower average fibre diameter and medullation percentage through crossing with exotic fine wool breeds not exceeding 50% exotic blood, with subsequent selection within the crossbreds

Policy Thematic Area 3: Camels

- Operationalization of the camel milk processing unit at Washuk District through a cooperative setup of LEDC and EF from LTQ
- Actively support studies on breeding, management, nutrition, performance and reproductive behaviour of camel
- Documentation of local camel breeds with phenotypic and molecular characterization
- Studies on utilization of rangelands and interaction with pastures and parasites focused at health, reproductive, productive and economic traits

- Studies on biology of reproduction, growth rate, puberty, heat resistance, oxidative stress, disease incidence and genetic markers for various health, productivity and economic traits
- Selective breeding for survival and economic traits

Policy Thematic Area 4: Poultry

- Development of entrepreneurship models through AIGN under an EF
- Facilitation to establish layers and broilers farming at appropriate locations in the public and private sectors to meet the local needs and generate employment
- Strengthening backyard poultry flocks for enhancing the productivity of poultry meat and eggs through establishment of elite indigenous nuclear flocks at zonal levels
- Introduction of artificial insemination at research and outreach levels
- Minimizing thermal and oxidative stress under intensive management

Policy Thematic Area 5: Cattle and Buffaloes

- Conservation of local cattle and buffaloes for meat and milk purposes
- Selective breeding on basis of health and economic traits
- Cross-breeding with semen from exotic breeds
- Development of an artificial insemination system through involvement of private farmers and veterinary practitioners
- Introduction of record keeping for heritable productivity parameters in cattle and buffaloes
- Introduction of an effective monitoring compliance system represented by various stakeholder
- Involvement of stakeholders or interest groups for establishing demo farms, nuclear stocks and SPUs

Policy Thematic Area 6: Reproductive Management of Animals

- Training, research and extension services on delayed breeding and poor growth rates of the young ones in various species of ruminants and camels
- Establishing research facilities at research and academic organizations in reproductive biotechnologies like semen quality, embryo transfer, cloning, semen sexing, transgenesis and other emerging technologies
- Research on interaction of reproductive performance with nutrition, thermal and oxidative stress, housing status and aflatoxins in various livestock breeds under field conditions
- Research on indigenous farming practices on reproductive performance of livestock breeds
- Enhancing the breeding coverage of cattle and buffaloes through artificial insemination in the public sector and involvement of qualified veterinarians; quality control of semen in the private market through SPUs
- Utilizing embryo transfer and related technologies for production of AI bulls and training of scientists and extension workers

- Establishing artificial insemination facilities for upgrading and crossbreeding the indigenous sheep, camel, goats, poultry and cattle, based upon indigenous research and farmers' outreach by the public sector organizations

Policy Thematic Area 7: Rangeland Management

- The range lands have been used for grazing of livestock as common properties however, these have been reduced by various reasons like influx of refugees, growing human and livestock populations and prolonged droughts. Overgrazing results in degradation of the rangelands.
- Balochistan can be divided into two zones: (i) the northern zone comprises the best ranges of the province located in the districts of Zhob, Loralai, Sibi, Nasirabad, Kohlu, Pishin, Quetta and Kalat; and (ii) the southern zone covering Khuzdar, Chagai, Kharan, Panjgur, Turbat, Gwadar and Lasbela (IUCN 2006). The former contributes 38% of the province area, carrying 76.5% of livestock while respecting values for the latter are 62% and 23.5%.
- The landscapes of the rangelands can be divided into six types including mountains, uplands, piedmont, desert, flood plains and coastal plains.
- Five animal production systems are found in the province namely, nomadic, transhumant, sedentary, commercial nomads and nomadic transhumant.
- An integrated strategy is required for rangelands development in the province to prevent the degradation process; establishment of check or delayed action dams.
- Indigenous knowledge must be integrated into the strategy involving local communities and traditions.
- Investigations on productivity and nutrient values of forages, development of seasonal calendar to ensure forage supply in winter or drought years.
- Introduction of high production drought and cold-tolerant fodder and shrubs to complement native rangelands.
- These pastures may be used during the critical forage deficit period and at the same time may allow some rest to the rangelands through rotational grazing.
- Organizing and training the local pastoral communities in taking care of herd mobility, maintenance of rangelands, production, health; facilitating value addition and marketing livestock and livestock products as entrepreneurship models.

2.2 Policy Sections

Policy Section 1: Institutional Mechanism - Farming to Entrepreneurship

- The Policy Matrix has been given under Box-2, tailoring the relevant policy section with the actions and implementation agencies.
- The livestock production systems remain subsistence-oriented. LDD has been providing services to the farmers; however, the commercial aspect of this resource-base is still unexplored and the poverty level in the province is high. Hence, this Mission suggests a policy shift from farming to Entrepreneurship. The technical gaps across the LBVC would be identified and rectified through applied research and expert consultations.
- Development of SMEs, entrepreneurship models and startups for milk, meat, wool & biotech-products under Livestock Technopark Quetta (LTQ), a Good Governance Model of Academia-Industry-Government Nexus.
- Registration of the entrepreneurs as private limited companies.
- Procedure has been provided in Box-1 for “Entrepreneurship Development and Registration Pathways”. Information will be shared with the stakeholders on registration procedures and requirements via different communication channels and it will be ensured to be accessible for potential and existing entrepreneurs especially women. Women's issues and challenges would be considered in registration and they would be encouraged to register. Excessive documentation requirements would be avoided.
- Interaction with local and international business support organizations, especially with Konya Teknokent (Technopark) under the MoU signed with Dairy Science Park during the Fourth International Conference and Industrial Exhibition held during 2017, participated by 50 delegates from Pakistan, including 10 from the public and private sectors of Balochistan (DSP 2017).
- Establishing a Livestock Entrepreneurship Development Centres to support the stakeholders in establishing entrepreneurship models across LBVC under the Academia-Industry-Government triple helix GGM.
- Provision of cost-effective feeds, fodder seeds, semen, bird packages, fertile eggs and hatchery units and accessories of appropriate sizes along with training and marketing backup, to the desiring potential entrepreneurs, educated males and females, along with training and extension services.
- Development of on-farm Entrepreneurship models through business incubation.

Policy Section 1-a: Institutional Mechanism - Entrepreneurship Development - Enabling Environment

- Introducing a system for traceability and Quality Control Certification of animals and animal products, which are mandatory for export of animal products across the country and international market
- Rectifying the price capping by the government, which discourages the livestock producers. The actual cost of production, grading products on the basis of quality and then setting reasonable and economic prices
- Rectifying the inhuman transportation and unhygienic slaughtering and processing of animals
- Introducing information technology across the LBVC and assisting the stakeholders in getting access to appropriate pastures, livestock and poultry varieties, availability of expertise in animal health, production and marketing, slaughtering facilities, products processing, local and international markets. Special apps may be developed for this purpose

- It will be ensured that entrepreneurs, especially women, are knowledgeable on how to use these apps - via training or guide materials .
- Investment may be promoted under the Balochistan Public-Private Partnership Act 2021, tailored with the ground realities

Policy Section 1-b: Institutional Mechanism - Entrepreneurship Development - Price Capping

- The inputs for livestock farming like price of animals, feeds, semen, medicine, vaccine, equipment, etc, are not regulated by the government while the prices of milk and meat are regulated by the district administration.
- The District Magistrate in consultation with the District Committee or otherwise, fixes prices of foodstuffs for different localities of the district.
- Due to higher input costs the farmers and shops sell higher quality products at somewhat higher rates who are punished by the district administration, however, those lowering their quality keep on doing their business.
- Hence, the price capping policy prevents survival and growth of those entrepreneurship models maintaining quality standards.
- The farm inputs are not subsidised by the Government, hence, there seems no justification to regulate prices of the products like milk and meat.
- The price capping must be totally removed through legislation at provincial and federal levels or assigned to the PCC of LTQ.

Policy Section 2: Institutional Mechanism – Farmers’ and Processors’ Empowerment

- Implementation of regulations without considering limitations of the stakeholders leads to a decline in societies.
- Although livestock is an important economic sector of Balochistan, the impact of farmers and processors on the policy making and resource distribution is negligible.
- In this province and other conflict-torn nations, animal production provides measures of social and economic security by offering access to food to residents in towns and villages, and ensuring that the population balance remains sustainable between rural and urban areas.
- Under Speedy India, FAO has placed a report to develop medium sized cooperative commercial units which are more susceptible to technological improvement and sustained supply.
- The advantages of such development are: (i) ownership remains with village people; (ii) enterprise enjoys economy of scale; (iii) technical advantages of industrial systems; (iv) regular supply, increased scale and participation of more people; (v) application of good practices.
- Various categories of farmers, processors and potential entrepreneurs would be organised into registered societies and private companies and involved in legislation, planning & dev through standing committees of the parliament and board of directors of LTQ.

Policy Section 3: Institutional Mechanism - Integrating Sustainable Development Goals

- This Policy is founded on the six SDGs; initiated through on-campus development of entrepreneurship models; supported by partner PSOs and industry and civil society for building the entrepreneurship network; leading to Halal food and biotech export.

- The proposed LSRSC at Department of Industries would monitor progress on the following SDGs and report to LTQ to be used as an interactive platform for achieving the targets:
- SDG 2, covering production of milk, meat and milk for local consumption and export;
- SDG 3 covering food safety for protection of public health;
- SDG 5, engaging women in the livestock sector transformation process;
- SDG 7, providing biogas and solar energy for farm operations and processing factories;
- SDG 8, ensuring generation of decent employment for the youth through business incubation and entrepreneurship development;
- SDG 16, ensuring end of conflict among stakeholders in the private and public sectors.

Policy Section 4: Institutional Mechanism – Establishing Endowment Fund

- For an uninterrupted functioning of the FUs of LTQ, an EF would be established to the tune of Rs. 1.72 billion, through provincial, federal and donor grants for developing entrepreneurship models.
- The EF would be managed by LTQ and released to the Functional Units (FUs) according to achievements and meaningful plans. The FUs may be HHP, LEDCs, CEGAPH, CEBEL, LSSC and LSRSC.
- The private sector would offer their land, animals, building and other assets for a period of at least 5 years with investment by LTQ and operational arrangements by private partners.
- The fund would be used for developing entrepreneurship models, providing facilities required at various affiliated centres and for establishing common facilities and processing units.
- Net profit for each project will be shared on periodical basis as:
- For new on-campus projects 10% to Government, 20% to the project lead, 39% relevant employees and workers, 30% to EF; and 1% to Insurance Fund.
- For ongoing on-campus ongoing activity the profit share would be 10% to Government, 30% to the staff and 60% to the EF.
- For off campus activities the profit distribution would be 80% for the industry and 20% for the LTQ and LTQ will pay honoraria to the relevant staff.

Policy Section 5: Institutional Mechanism – Establishing Functional Units (FUs)

- Various Functional Units of LTQ will be added to the public service organizations as agreed in the relevant meetings and reported in record notes. These units will include centres of excellence at the universities (CEGAPH and CEBEL), livestock entrepreneurship development centres (LEDCs/HMREC/HHPs) at various government departments and the universities, and SME support cells at the Department of Industries and QCCI.
- The Functional Units will work at the affiliated public sector organisations under the supervision and funding of LTQ. Herd Health Program (HHP) teams will serve the private farmers in introducing good practices to enhance productivity and products quality; LEDCs/HMREC would provide a one-window service to the all the stakeholders across the livestock chain regarding applied research, clinical and diagnostic services, training and local/international marketing linkages; CEGAPH/CEBEL will conduct applied research in genetic improvement for economic and survival traits of the indigenous livestock/poultry species and enhancing entrepreneurship potential through protocols development;

LSSC/LSRSC would help the existing/emerging and potential SMEs in removing the financial, marketing and regulatory barriers in their value chains.

- These functional units, especially SME support cells and SME regulatory support cells would be trained on gender-sensitive practices and these practices would be observed in carrying out their mandates - prevent gender-based discrimination, sexual harassment.
- As the functional units are located at various departments under supervision of Administrative Secretaries, a project management unit (PMU-LTQ) will be established at the Planning and Development Department, Government of Balochistan for coordination among the various departments, universities and private groups/civil society through the QCCI.

Policy Section 5-a: Institutional Mechanism - Livestock Entrepreneurship Development Centres (LEDC)

- Nine LEDCs (Figure 4) would be established at PSOs or private firms and run as PPP-based joint ventures through management committees under an LTQ Endowment Fund. LEDCs would provide farmers an access to farm inputs, products sale, products processing, training and regulatory support.
- The Centres would be providing facilities of establishing model farming, milk and meat shops, products processing factories, diagnostic labs, marketing and allied facilities.
- The Centres would be providing facilities of establishing model farming, milk and meat shops, products processing factories, diagnostic labs, marketing and allied facilities.
- Outgoing graduates at the universities would be provided facilities for internship and enthusiastic faculty members would be facilitated in demonstrating feasible entrepreneurship models across LBVC.
- The outgoing male and female graduates would be incentivised in the form of stipend, honoraria for special assignments, free accommodation and research funds to dispose off their jobs during the internship duration. Special funds would be arranged for demonstrating their entrepreneurship models effectively, especially in the remote and backward areas. Successful models would be followed up to registration as private companies.
- Specialised facilities would be provided like mini feed mills, mini slaughterhouses, mini dairy factories, hatchery services to the farmers for breeding of layers, quails, fancy and rare birds.
- Common facilities for cold chain and value addition of livestock products would be provided to the farmers for enhanced profitability and prevention of post-harvest losses.

Policy Section 5-b: Institutional Mechanism - Centre of Excellence for Genetics of Animal Production and Health (CEGAPH)

- CEGAPH would be established in northern Balochistan with these objectives
- Identification of genetic markers for various survival and economic traits and stress resistance
- Studies on health, productive, reproductive and nutritional parameters of genetically improved breeds and development of kits for local market and export
- Investigations on fertility, growth, fecundity, stress, diseases resistance, wool, meat and dairy characteristics
- Genetic documentation of the local breeds at international levels
- Screening of imported animals and candidate breeding bulls for diseases, stress markers and economic traits

- Diagnostic services for bacterial, viral and parasitic diseases of economic and public health importance through molecular investigations and development of kits
- Research on development of exportable biotech products and services
- Species identification and Halal certification of meat through molecular investigations

Policy Section 5-c: Institutional Mechanism - Centre of Excellence for Biology and Entrepreneurship of Livestock (CEBEL)

- CEBEL would be established in southern Balochistan with these objectives:
- Health indicators and diagnostic techniques for various bacterial, viral and parasitic diseases; control measures, ethno-veterinary practices and incorporation of recent trends of preventive medicine for indigenous and crossbred livestock of southern Balochistan in collaboration with sister labs
- Genotypic and Phenotypic characterization of for indigenous and crossbred livestock of the southern Balochistan
- Reproductive management, stress physiology and breeding strategies for indigenous and crossbred livestock
- Nutrition, feeds, fodders and range potential of the for indigenous and crossbred livestock; Prevailing livestock husbandry and marketing practices of all breeds in Balochistan
- Development of molecular kits and other biotech products for local consumption and export
- Economic traits of growth, fertility, stress resistance and production of meat, milk, wool, hides and skins and other products
- Studying feasibility models for meat, milk and wool production on different feeding regimes and propagation through incubating startups
- Value addition of meat, milk and other products through processing, preservation, labelling and marketing techniques
- Training of potential entrepreneurs in demonstrated models
- Incentives will be provided to women entrepreneurs to participate in training, use different training methods and approaches to facilitate women's participation in training and prevent sexual harassment/gender-based discrimination (e.g. online training, dedicated training for women, etc.)
- Addressing the technical, administrative and legal barriers across livestock breeding value chain to reach the international market

Policy Section 5-d: Institutional Mechanism - SMEs Support Cells

- The Department of Industries will host a Livestock SMEs Regulatory Support Cell (LSRSC) and Quetta Chamber of Commerce and Industry will host a Livestock SMEs Support Cell (LSSC)
- The Cell will coordinate among various components of LTQ (four public sector departments of LDD, Forest, LG and Industries and the four universities of BU, BUIITEMS, SBKWU and LUAWMS) & SMEDA and provide solutions to issues
- To utilise the strengths of the public service organizations in the province and get their inputs in pursuing the objectives of the Policy. Guiding Principle of the policy would be: On-campus development of entrepreneurship models; supported by Government Departments, industry and civil society for building the entrepreneurship network; leading to Halal food export

- The Cells will be responsible for e-marketing for which apps may be developed by relevant faculty members and postgraduate students of BUIITEMS
- The Cell will maintain data of the registered farmers and processors and facilitate paid internship of the outgoing undergraduate students and thesis research of postgraduate scholars to provide solutions to the issues faced
- Data of the registered farmers and processors will be maintained on gender-disaggregated basis by the SMEs Support Cells and support will be provided through paid internship of the outgoing undergraduate students and thesis research of postgraduate scholars to provide solutions to the issues faced.
- The Cell will look for local and international investment at the state land
- The Cell will explore international trade for livestock and livestock products
- To facilitate launching of mega projects on slaughter houses, hides and skins processing, cold storages, chilled transportation and chilled cargo services via roads, at the airport and the aeroplanes, as per need
- To introduce quality control practices through sister organizations at all stages of LBFVC and certify the products for entering into the local and international market
- To utilise the various activities across LBFVC for development entrepreneurship models involving the university graduates through the ORIC offices and SMEDA and facilitate registration of such companies
- To introduce a Market-oriented Production Strategy
- To establish Farmers Business Facilitation Centres in the remote areas and at the public and private sector organizations

Policy Section 6: Institutional Mechanism – Introducing Good Governance Model - Departmental to Integrated Approach - AIGN

- Providing a GGM (Figure 2, Figure 3) to overcome the challenges to the private sector, impeding entrepreneurship development across LBVC, preferably the Triple Helix Model of Academia-Industry-Government Nexus (AIGN, FAO 2019)
- Establishing and registration of societies of farmers (sheep, goats, camels, cattle and buffaloes, beef animals and poultry), butchers, milk and eggs dealers and their involvement in the research and development process of the public sector organizations and academia
- Establishing a database of the affiliated farming and processing units, services and marketing partners for the purpose of technical and marketing support and capacity building. The information would be made easily accessible for the potential entrepreneurs, both males and females.
- Centre of Excellence for Genetics of Animal Production and Health (CEGAPH) will be established in the north and Centre of Excellence for Biology and Entrepreneurship of Livestock (CEBEL) in southern Balochistan; to work on the relevant issues and support entrepreneurship development across LBVC
- Establishing a Livestock Technopark Quetta (LTQ), an autonomous body managed by BoG: (i) having representation from relevant public sector organizations and representatives of farmers, processors' entrepreneurship groups; (ii) with legislative, regulatory, financial and administrative powers; (iii) to boost up entrepreneurship development across LBVC for generation of decent employment and exportable surpluses through the LEDCs/CEGAPH/CEBEL; and (iv) supporting LTQ through an EF with friendly rules for the stakeholders, engaging them in partnership for their animals, lands, equipment and services

- Gender-awareness raising, sensitization and training would be arranged for employees and associated workers of Livestock Technopark and affiliated Units and Organizations.
- Women-led cooperatives and women's business associations will be included in the Capacity Enhancement of PSOs program.

Policy Section 6-a: Institutional Mechanism - Enhancing Capacity of Public Sector Organizations

- The public sector organizations (PSOs) have been established with predefined mandates and limited resources. The current and development budget of LDD is supporting animal health and breeding coverage while marketing and entrepreneurship support are the ignored areas. Hence the mandate of the departments needs to be expanded to new domains covered under Balochistan Government Rules of Business 2012. Clause 13 calls for value addition and marketing of livestock and poultry products and by-products, and Clause 16 requires registration and inspection of all kinds of livestock, dairy and poultry farms. Under these clauses, the marketing status of livestock and livestock products need to be improved and the farms need to be registered and supported for entrepreneurship potential at the herds owned by the farmers.
- Presently, the Forest Act has been in place after approval by the provincial assembly. As per clause 36 (1) b, the Provincial Government may, by notification in the official Gazette, regulate or prohibit in any forest or waste-land, the pasturing of cattle. It is noted that grazing at such pastures may be regulated through rotational grazing for regeneration of grasses, herbs and shrubs, instead of total prohibition, to support the pastoral community. This policy suggests establishment of Livestock Entrepreneurship Development Centres with the support of sister departments, academia and the private sector for developing entrepreneurship models.
- Under Clause 17(1) of the Rules of Business, Industries and Commerce Department has to undertake Planning and Development of Industries, including Cottage Industries. Livestock and poultry farming and products processing factories provide excellent models for such industries and their promotion and facilitation through an integrated approach is recommended. Such a network would be helpful in generating traceable, Halal and hygienic foods for local and international markets as well as generating decent employment for the young men and women.
- The farmers expect from CVHs of LDD to provide some free medication to treat the diseases instead of some good advice to enhance profitability of livestock. Such behaviour of the farmers may be rectified so that the farmers may look for advice to enhance farm profitability and to reduce cost per unit productivity. Outreach facilities of research departments and universities may be improved to achieve such targets.
- The government departments do not possess the facilities and mandate to respond to the demands of the investors and potential farmers, processors and entrepreneurs regarding availability of funds, marketing support, administrative and legislative support. Necessary arrangements may be made to fill this gap.
- Clause 30, Sub-clause (2), of the Public Procurement Rules 2004, calls for comparison of the items on the basis of cost. Lower price means lower quality of items creating audit complications for enthusiastic officers which needs rectification. Local committees may be authorised to generate and spend funds from the Endowment Fund.
- Additional resources and regulatory support will be provided to the public sector organizations and academia under the Endowment Fund. Financial and career incentives may be provided to best performers

Policy Section 7: Institutional Mechanism - Establishing Livestock Technopark Quetta (LTQ) - Board of Governors (20)

- Secretary Livestock and Dairy Development Balochistan	Chairman
- Vice Chancellor/Pro Vice Chancellor, Balochistan University	Co-Chair
- Representative of Secretary Forest Balochistan	Member
- Representative of Secretary Local Government Balochistan	Member
- Representative of Secretary Industries Balochistan	Member
- Representative of Secretary Women Development Balochistan	Member
- Director General Animal Health LDD or representative	Member
- Dean Life Sciences, Balochistan University or representative	Member
- Dean Veterinary and Animals Sciences LUAWMS or representative	Member
- Dean Life Sciences BUIITEMS or representative	Member
- Dean Life Sciences, SBKWU or representative	Member
- President QCCI or representative	Member
- Two commercial cattle farmers, 2 sheep, goat and camel farmers; 1 each dairy/meat processors/women-led cooperative to be nominated by President QCCI (total 7)	Members
- Director CASVAB, University of Balochistan	Secretary

Policy Section 7-a: Institutional Mechanism - Establishing Livestock Technopark Quetta (LTQ) - Functions

- An active and visible interaction among academia, industries, government and the civil society, as a Good Governance Model, to provide feasible solutions to the emerging issues faced by producers, processors, service providers, marketing partners and consumers.
- Introducing farming innovations like introduction of biotechnologies, solar technologies, food technologies and bio-waste management.
- Development and replication of interlinked entrepreneurship models in livestock and poultry production, processing, marketing, quality control, diagnostics, veterinary clinical, processing and biotech products, marketing and legislative services, engaging university students and graduates; as source of decent employment and exportable surpluses.
- Improving and establishing slaughterhouses and meat processing facilities through joint ventures or public and private sector investment.
- Establishing a cold chain for transportation of milk, meat and by-products across district, provincial, national and international borders for meeting local and international marketing requirements and standards.
- Development of an environment-friendly and ethically sound transportation system for animals through public-private partnership or other models.

- Development and notifying standard operating procedures for quality control, food inspection and traceability of livestock-based food products, foods, feeds, medicines, vaccines, other biologics testing for local and international market; through registered laboratories in the public and private sector; the farm inputs available would be analysed for quality and price comparison and notified for reducing production cost and enhancing quality of farm products.
- Protecting financial, marketing, legal & public health interests of stakeholders, especially the price regulation, across the LBVC and exemption of the registered entrepreneurs and institutional units from all types of taxations.
- Establishing common facilities centres for entrepreneurship inputs supplies, advocacy, training and marketing.
- Improving the livestock markets and introducing innovative technologies in marketing and communication among stakeholders to maintain quality standards, traceability, linkages with the local and international market and for harvesting new talent.
- Holding international conferences and industrial exhibitions on Livestock Transformation; workshops on bio risk management; collaboration with international organizations.
- Establishing disease free zones for various diseases through surveillance and quarantine across the border districts, qualifying products for exports.
- Removing bottlenecks impeding development of entrepreneurship models, across LBVC, to achieve and maintain self-sufficiency and efficiency in meat, milk and wool production, processing and marketing and providing feedback to administrative and legislative bodies for taking corrective measures to generate decent employment and exportable surpluses.

CHAPTER 3 ACTION PLAN AND IMPLEMENTATION STRATEGY

3.1 Policy Shift

- 1. The existing livestock breeding policy in practice in the country is not relevant to Balochistan as it reflects a stereotyped approach focusing on Dairy Production, based upon development of cattle and buffaloes. These animals need a large amount of feed, fodders, water and market access on a daily basis which are not available in Balochistan, a mostly arid or hilly region contributing 55.3% of the national rangeland of 57.2 Mha. Hence, the province can support meat production through sheep, goats, camel and cattle, contributing 52, 22, 41 and 11% of the national population. Quality of these breeds may be improved through selective and crossbreeding using natural service or artificial insemination. Economic traits like growth rates, fertility, productivity and disease and stress resistance may be used as indicators for genetic improvement.
- 2. Zonal requirements for various livestock breeds, using Jersey semen in areas with fodders and water scarcity and HF semen in other areas.
- 3. The subsistence livestock farming may be shifted to a commercial one, and the approach of service delivery may be shifted from departmental approach towards an integrated approach, providing an enabling environment through AIGN for creating entrepreneurship models across LBVC.
- 4. Role of middleman, aggregator and market committee, etc, would be defined, regulated, facilitated and made friendly with the producers, processors and marketing partners. Quality control practices and certification would be integrated to ensure traceability of products, to be qualified for metropolitan supermarkets and national/international food supply chains.
- 5. The livestock herds in the private sector may be registered; supported for conversion into entrepreneurship models and the products like meat, milk, eggs and wool may be value added backed up with cold storage and marketing at local, national and international levels.
- 6. The registration of this almost totally unregistered sector is a gigantic task hence a specific roadmap will be prepared in consultation with Regulatory authorities and private sector. The Board of Governors of LTQ, represented by the relevant public and private sector stakeholders, would guide such a process through regulations under the administrative arrangements of LSRS Cell at the Department of Industries.. The roadmap would be implemented by the Livestock SMEs Regulatory Support Cell at the Department of Industries and Livestock SMEs Support Cells at QCCI.
- 7. SPU and AI Centres would be strengthened at district level through innovations, advanced research and ease of doing business.
- 8. Strengthening of Embryo Transfer Lab through collaboration with research and academic organizations in reproductive biotechnologies like fertility parameters for semen and oocytes, embryo transfer techniques, cloning, semen sexing, transgenesis and other emerging technologies
- 9. Mainstreaming gender in LBVC: Key areas for intervention include:
 - a. Collecting and maintaining gender-disaggregated data of entrepreneurs in LBVC - can be helpful to assess specific challenges of women in LBVC
 - b. Conducting gender awareness-raising, sensitization and training among PSO's, newly formed support cells and entrepreneurs (men and women) and ensuring that these bodies practise gender-sensitive approaches
 - c. Ensuring women's representation in LTQ and including women entrepreneurs, women-led cooperatives and women's associations in policy consultation processes (legislation, implementation, evaluation)

- d. Facilitate women's access to technical information, information on registration procedures and requirements, available resources, incubation and capacity building opportunities and funding opportunities

3.2 Herd Health Program (HHP)

HHP teams will be constituted engaging the qualified staff of the Livestock Department and university graduates, to support the farmers in improving health, breeding and reproductive efficiency; to improve products quality; and to reduce the per unit productivity cost through improved practices. Entrepreneurship models would be developed engaging the postgraduate students at the proposed LEDCs jointly by the farmers, processors, universities and government officials through business incubation. Hygienic and Halal quality and traceability standards would be integrated into LBVC by the affiliated Centres of Excellence and Analytical Labs. Successful models would be selected as startups and university graduates would be sponsored to establish private companies for generating decent employment.

3.3 Breeding Services

The peri urban dairy farms have been getting breeding services from some veterinarians, veterinary assistants and unqualified quacks. The semen produced at Semen Production Unit (SPU) is sold at Rs. 200 while in open market the rate is from Rs. 20-30 and such services are utilised by small farmers or disorganised commercial farmers. Commercial farmers, believing in quality and economic returns for high quality inputs, utilise semen from Maxim Agri Pakistan Ltd or ICI Pakistan Ltd, at a rate exceeding Rs. 5000 up to 10,000 per dose of traditional and sexed semen. The farmers are satisfied with the results of such semen. Access of the interested commercial farmers to such high-quality inputs, may be facilitated through the proposed HHP and LEDC.

3.4 Postpartum Rebreeding and Feeding Plan (PRFP)

PRFP would be implemented at the registered farms. The high yielding A-grade cows, more than 30 litres per day would not be inseminated for three observed heats or 100 days for postpartum as such animals are under metabolic and lactation stress and may fail to conceive leading to metritis. For animals producing more than 25 litres the breeding interval would be two missed heats or 80 days and for animals producing more than 20 litres would be bred after one missed heat or 60 days. The A-grade cows would be provided A-grade rations with sufficient energy, proteins, macro and micro minerals, bypass protein, bypass fats, amino acids and antioxidants. The B-grade cows would be provided a B-grade ration and the C-grade cows would be provided a C-grade ration with sufficient energy, protein and minerals. For buffaloes breeding, high quality bulls may be obtained from specified areas of the Punjab, to improve the future generation.

3.5 Development of Livestock Farms

- 1. State land available with the LDD, Forest and Revenue departments may be utilised for maintaining local breeds of sheep, goats and camel under advice of the Board of Governors, LTQ as follows:
- 2. Funds may be arranged by provincial and federal governments or donors and local and international investors.
- 3. Local farmers may be approached for providing land and animals for such joint ventures under public-private partnership (PPPs).
- 4. PhD Scholars from Balochistan, undergoing studies in inland and foreign universities, may be assigned thesis research in these domains.
- 5. Intensive selective breeding may be practised to propagate the top 10% animals and cull the bottom 20%; marker assisted selection may be practised to select breeding bulls and dams with economic traits like disease resistance, stress resistance, fertility, growth rate, milk and wool yield, etc.

- 6. Private farmers may be engaged in the process through the Open Nucleus Breeding System (ONBS), providing them with elite animals and similarly buying back.
- 7. Sires may be selected through this process and used for production of semen and natural service. Embryo transfer may be used for production of artificial insemination bulls.
- 8. Animal recording system may be introduced for keeping records of animals at state farms and registered private farms. This system may be utilised for e-marketing of local animals at national and international levels.
- 9. Semen production protocols may be developed at SPUs for local breeds of sheep, goats, cattle and camel. The semen produced may be utilised for breeding of local livestock population and may be offered for sale at national internal markets.
- 10. An Expert Group on Animal Breeding and Reproduction (EGABR) may be established for providing technical inputs in all these areas, through annual or special meetings or webinars.

3.6 Feeds Entrepreneurship Models

The feed mill was established in 1984, for poultry and cattle feed to Government Farms. Presently Feed mill is non-functional due to non-availability of the fund although the nutritionist specialist (PhD) is available for preparation of feed. Availability of Endowment Fund and public-private partnership proposed under the policy would make the feed mill functionalised and replicated in other parts of the provinces, preferable under lease arrangement. The proposed Herd Health Program would assist the commercial livestock farmers in analysing their feed samples for nutrients and toxins analysis, ration formulation for various meat and dairy breeds under field conditions and the qualified graduates would be trained in entrepreneurship development under real time situations.

This activity would be supported through budget allocation under the provincial government's Annual Development Program/PSDP, donors assistance, private sector investment at national and international level. In addition Livestock Technopark Quetta will support it through allocation under their allocated Endowment Fund on a competitive/achievements basis.

3.7 Sheep, Goats and Poultry Entrepreneurship Models

Two development schemes with ongoing status during 2021-22, (i) kid/lamb fattening in Balochistan (PM-initiative) (provincial share, Rs. 248 m for CFY); and (ii) backyard rural poultry Balochistan (provincial share, Rs. 76 m for CFY) may be used for business incubation and entrepreneurship development through a visible interaction with sister departments, academia and Quetta Chamber of Commerce and Industry.

3.8 Livestock Entrepreneurship Development Centres (LEDCs)

LEDC would be established at: (i) Camel R&D Centre Washuk; (ii) Dairy Farm Kehaan Zehri Tehsil, Khuzdar; (iii) Beef Production and Research Centre Sibi; (iv) University of Balochistan (Kharan); (v) BUIITEMS (Zhob); (vi) Forest Department (Turbat); (vii) LG Department (Mashriqi Bypass); (viii) LUAWMS (Lasbela); (ix) SBKWU (Nushki). LEDCS would be run as joint ventures through local committees under an EF to provide farmers an access to farm inputs, products sale, products processing, training and regulatory support. The Centres would be providing facilities of establishing model farming, products processing factories, milk and meat shops, diagnostic labs and marketing facilities. LTQ would support the LEDC through EF, applied research and expert guidance.

3.9 Engagement of Relevant PSOs

Nine public sector organizations (PSOs) were engaged under this Mission namely, Livestock, Forest, Local Government and Industries Departments for assessing their current and potential roles in the Policy related issues; BU, BUIITEMS, SBKWU and LUAWMS for sharing academic wisdom and QCCI for engaging the real stakeholders affected by the Policy, i.e. the livestock farmers, products processors, marketing bodies and

practising veterinarians working with private sector. Separate Functional Units (FUs) were proposed for each of the nine PSOs to participate in the implementation strategy of this Policy.

3.10 Good Governance

A Good Governance Model (GGM) will be launched to overcome the challenges to the private sector, impeding entrepreneurship development across livestock-breeding-value-chain (LBVC).

3.11 Livestock Technopark Quetta (LTQ/Teknokent)

Presently, LBVC is provided services officially and mainly, by the Director General Animal Health with a handsome current budget of Rs. 4.53 billion under BC21028 (28) Animal Husbandry and development budget of Rs. 1.63 billion under 042106 - Animal husbandry as per official online resource-base. Looking at the SNE for 2022, it appears that the farmers are served by the regular staff stationed at Civil Veterinary Hospitals and Dispensaries, Livestock Farms, SPUs, livestock, dairy and poultry farms, etc. Management of the LBVC by Directorate General Animal Health may be supplemented with inputs from PSOs through an autonomous LTQ with legislative, regulatory, financial and administrative powers, to boost entrepreneurship development, regulating and facilitating all the FUs at PSOs. An endowment fund (EF) may replace the repeated funding to remove the financial burden on the government treasury.

3.12 PSOs Support

Additional resources and regulatory support will be provided to the 9 PSOs for their approved activities as per need, under the EF and non-lapsable development grants (NLDG). Financial and career incentives will be provided to best performing staff members. Development of SMEs would be facilitated for meat, milk, wool & biotech-products. Price capping will be removed through legislation at provincial level or assigned to the proposed PCC of LTQ, to rationalise the prices in accordance with the expenses and profit margins.

3.13 SMEs Support Cells

The Department of Industries will host a Livestock SMEs Regulatory Support Cell (LSRSC) and Quetta Chamber of Commerce and Industry will host a Livestock SMEs Support Cell (LSSC). The LSSC will coordinate among various components of LTQ (four public sector departments of LDD, Forest, LG and Industries and the four universities of BU, BUIEMS, SBKWU and LUAWMS) & SMEDA and provide solutions to issues. The proposed LSRSC at the Department of Industries would provide administrative and regulatory supports for SMEs development and monitor progress on the following SDGs and report to LTQ to be used as an interactive platform for achieving the targets: SDGs 2, 3, 5, 7, 8 and 16.

3.14 Centres of Excellence

Centre of Excellence for Genetics of Animal Production and Health (CEGAPH) will be established at Balochistan University and Centre of Excellence for Biology and Entrepreneurship of Livestock (CEBEL) at LUAWMS. CEGAPH will work on Identification of genetic markers for various survival and economic traits and stress resistance and will study health, productive, reproductive and nutritional parameters of genetically improved breeds. CEBEL will integrate the biological knowledge of animal health, management, nutrition, breeding and reproduction with the entrepreneurship development potential across LBVC.

3.15 Entrepreneurship Network

The nine PSOs would work in coordination under the umbrella of the integrated model of LTQ to achieve the common goals of transforming the provincial livestock resources into prosperity for the people. These resources would be utilised for generating decent employment and quality certified, traceable and hygienic Halal foods and biotech products for local and export markets, through an interconnected network of entrepreneurship models, covering livestock and poultry farming, dairy and meat factories, diagnostic, clinical and consultancy centres and marketing facilities. A Livestock SMES Regulatory Support Cell (LSRSC) will be established at the Department of Industry and a Livestock SMEs Support Cell (LSSC) at QCCI to support entrepreneurship development, getting SMEDA inputs.

Expected Outcome

Cost estimate of this Action Plan has been given under Table-1 and the “Outcome After 3 Years” has been given under Figure 5.

It is expected that 9 LEDCs will engage about 250 farmers and 25 meat factories (total 275 entrepreneurship models), producing 4.5 million kg meat per annum. The total cost of this proposal is Rs. 3.0 billion or US\$ 12.3 million while annual production is US\$ 22.5 million or Rs. 5.42 billion out of which 10% may be exported equal to US\$ 2.25 million or Rs. 0.54 billion. The 275 models would generate 2750 new entrepreneurship models on an annual basis, each model generating about 10 decent employments, totalling 27500 decent employments per year.

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APPENDICES

CONSULTATION WITH THE STAKEHOLDERS

1.1 Livestock and Dairy Development (Ext Wing) (Record Note, 23 Aug 2022)

Visited Office of Secretary LDD along with Mr Habibullah Nasir, Balochistan Policy Officer ITC. The delegates were welcomed. The first output was completed through literature review and poor governance in the livestock sector was found as a major bottleneck in utilizing the resources for prosperity of the people in the province in spite of having 52%, 22%, 41%, and 11% of the national sheep, goats, camel and cattle population, respectively (Appendix 2.1, Figure 6).

The LDD Extension Wing is taking care of animal health and production, CASVAB is contributing in research and vaccine production, the Forest Department is taking care of the ranges, the Industries Department is responsible for SMEs development, Local Government Department is taking care of livestock markets and slaughter houses and QCCI and Livestock Farmers Association (LFA) are taking care of the commercial producers and processors. However, a lack of coordination and good governance has resulted in a meagre impact on the development status of the livestock sector. Therefore, the Consultant prepared a schedule for meeting with all the stakeholders to streamline the services to the livestock farmers and processors and provide an enabling environment for entrepreneurship development focused on generation of decent employment and exportable surpluses.

The following day a meeting was held with senior officers of LDD Department comprising Director General LDD, Director General Farms, Director Planning, Director Research, Director Animal Health and other officers. Director Research informed that Balochistan Livestock Breeding Act 2016 was drafted and presented before the Provincial Cabinet. It was decided that the Breeding Policy may be developed before the Act. Productivity improvement of the native breeds was emphasised. A benchmark survey of 2011-12 identified wool as a source of farmers' income.

Crossbreeding of local sheep with Khurasani resulted in increased farmers' income through higher weight gains. However, the natural calamities like drought resulted in sale of 100 sheep for Rs. 10,000 which is a great loss to the farmers. Wool is purchased from the farmers at throwaway rates. Mastung Wool Research Centre is working on a limited scale.

Sheep were previously exported to the Middle East which fetched higher rates than those from Australia. It was observed that daily weight gain was higher at ranges in sheep. The semen production unit Quetta (SPU-Q) has been producing HF semen; however, semen is also available in the private sector without any check on quality. In addition, the SPU-Q HF semen is sold at Rs. 200 per dose, while in the open market, it is sold at Rs. 20-30 per dose. The farmers look for cheaper semen in the open market and prefer HF semen. Some of the commercial farmers have established dairy herds in areas where fodders and water are available.

It was noted that with the introduction of exotic breeds through artificial insemination (AI), the resistance of local cattle against the infectious diseases like Foot and Mouth Disease, babesia, theileria, ticks and lumpy skin diseases got reduced. Brucella also got increased in these animals, causing abortion and spread through the aborted materials. A visit was made to Semen Production Unit, Embryo Transfer Laboratory and Liquid Nitrogen Plant.

It was recommended that the semen available in the open market may be monitored and certified for quality parameters and by the SPU-Q. Jersey semen is more suitable for genetic improvement of cattle in Balochistan as their body size and water and feed requirements are less and milk yield is appropriate and cost-effective as compared to HF. The farmers may be provided a recording system for the breed, pedigree information, semen production lab, date of production of semen used and name of the inseminator. Sheep, goats and camels farming may be incentivised.

Recommendations

- The existing livestock breeding policy in practice in the country is not relevant to Balochistan as it reflects a stereotyped approach focusing on Dairy Production, based upon development of cattle and buffaloes. These animals need a large amount of feed, fodders, water and market access on a daily basis which are not available in Balochistan, a mostly arid or hilly region contributing 55.3% of the national rangeland of 57.2 Mha. In the north, 38.0% of rangeland supports 76.5% livestock, and in the south, the respective values are 62.0% and 23.5% (Ahmad and Islam 2011). Hence, the province can support meat production through sheep, goats, camel and cattle, contributing 52%, 22%, 41% and 11% of the national population, respectively. Quality of these breeds may be improved through selective and crossbreeding using natural service or artificial insemination. Economic traits like growth rates, fertility, productivity and disease or stress resistance may be used as indicators for genetic improvement.
- The products like meat, milk, eggs and wool may be value added backed up with cold storage and marketing at local, national and international levels.
- Enabling environment may be provided through AIGN for creating entrepreneurship models across LBVC.
- State land available with the LDD, Forest and Revenue department may be utilised for maintaining local breeds of sheep, goats and camel under advice of the Board of Governors, LTQ as follows:
- Funds may be arranged by the provincial and federal governments or donors and local and international investors.
- Local farmers may be approached for providing land and animals for such joint ventures under public-private partnership (PPPs).
- PhD scholars from Balochistan, undergoing studies in inland and foreign universities, may be assigned thesis research in these domains.
- Intensive selective breeding may be practiced to propagate the top 10% animals and cull the bottom 20%, and marker assisted selection may be practiced to select breeding bulls and dams with economic traits like disease resistance, stress resistance, fertility, growth rate, and milk and wool yield.
- Private farmers may be engaged in the process through the Open Nucleus Breeding System (ONBS), providing them with elite animals and similarly buying back.
- Technical inputs may be acquired from an Expert Group on Animal Breeding and Reproduction (EGABR) through annual or special meetings or webinars.
- Sires may be selected through this process and used for production of semen and natural service. Embryo transfer may be used for production of AI bulls.
- Animal recording system may be introduced for keeping records of animals at state farms and registered private farms. This system may be utilised for e-marketing of local animals at national and international levels.
- Semen production protocols may be developed at SPUs for local breeds of sheep, goats, cattle and camels. The semen produced may be utilised for breeding of the local livestock population and may be offered for sale at national internal markets; strengthening of SPU and AI Centres was recommended at district level.
- Strengthening of Semen Production Unit, AI Centres, Embryo Transfer Lab, launching of HHP and LEDC (renovation) at (i) Camel R&D Centre Washuk; (ii) Dairy Farm Kehaan Zehri Tehsil, Khuzdar; (iii) Beef Production and Research Centre Sibi, were accommodated in the Action Plan and Budget proposed under the policy draft.

1.2 Livestock and Dairy Development (Res Wing) (Record Note, 24 Aug 2022)

Visited Office of Secretary LDD along with Mr Habibullah Nasir, Balochistan Policy Officer ITC. The delegates were welcomed. Mr Habibullah presented the background of the consultative process focusing on providing additional space for the private sector, gender lens, environment, ease of doing business and enterprise development. The International Trade Centre (ITC), a joint agency of the World Trade Organization (WTO) and the United Nations (UN), implementing the EU-funded 'Growth for Rural Advancement and Sustainable Progress' (GRASP) project, engaged Prof Subhan Qureshi as the National Consultant for developing the "Balochistan Livestock Breeding Policy 2022" (Appendix 2.2, Figure 7).

Lack of coordination among various PSOs in serving the LBVC and good governance has resulted in a meagre impact on development status of the livestock sector. Therefore, the Consultant proposed a GGM as an Academia-Industry- Government Nexus through establishment of Livestock Teknokent Quetta (LTQ, Technopark). The Consultant prepared a schedule for meeting with all the stakeholders to streamline the services to the livestock farmers and processors and provide an enabling environment for entrepreneurship development focused on generation of decent employment and exportable surpluses.

A meeting was held with the faculty members of Centre of Advanced Studies in Vaccinology and Biotechnology (CASVAB). A presentation was made by the Director CASVAB on the available manpower and laboratory resources, achievements, issues and future vision of the Centre. Established in 1983 as the Veterinary Research Institute, the institute was upgraded to CASVAB with the vision to offer MPhil and PhD degrees in the fields of Microbiology, Biotechnology and Molecular Biology, Physiology and Endocrinology, and Nutrition and Toxicology, to utilise the services of foreign qualified professionals available in the institute and to produce affordable quality vaccines. CASVAB has got 56 sanctioned posts of 8 professors and associate professors each and 20 assistant professors and lecturers each. Out of these, only 26 posts have been filled up.

The ITC experts expected that they believe in reducing the role of government from tight regulations towards facilitation to improve the service delivery and benefits to the people. In addition to the traditional vaccines, CASVAB researchers may work on development of subunit vaccines and other biotechnological products through basic research and prototypes development, ultimately leading to commercial production. A major hurdle to the researchers has been the conventional public procurement rules, which rely on lower rates, which are associated with lower quality and any deviation towards high quality products with somewhat higher prices lead to audit complications and harassment of the scientist.

CASVAB is facing electricity disruption, which is a big hurdle for a Microbiology institute in smooth lab work on preservation of cultures, cell lines and routine lab work. In spite of frequent power outages, they are receiving about Rs. 3 million of bill of electricity and gas annually. They are receiving about Rs. 5.5 million of budget from LDD Department. They have to pay the utility bills as well as for media, chemicals and bottles for vaccines from the allocated budget. The university is paying huge salaries to faculty members and lower staff involved in vaccine production. If they exclude salaries, even then they supply vaccines at a rate lower than Rs. 1 per dose. If LDD-VRI starts its vaccine production, CASVAB can play a role in meaningful research on vaccinology, biotechnology, genetics, nutrition and endocrinology. The Centre may run independently under a board of governors, representing membership from different organizations. However, for research purposes special fundings are required. Experience of CASVAB can be utilised for livestock development in the province if there is good coordination with sister organizations.

The Consultant presented the policy outline and proposed establishment of LTQ at the University of Balochistan under a Board of Governors representing the stakeholders, having a Centre of Excellence for Genetics of Animal Production and Health (CEGAPH) at the city campus with the cost estimate and a network of Livestock Entrepreneurship Development Centres (LEDCs) in the sister organizations.

The participants offered their support to contribute their share in making the Balochistan Livestock Breeding Policy 2022 a success story. Their expertise and laboratory resources available in the fields of vaccine development and production, disease diagnostic services, feed analysis, toxicology, reproductive physiology, endocrinology, microbiology, biotechnology and molecular biology may be utilised in supporting animal health and productivity. The postgraduates (MPhil and PhD) may be involved in basic, advanced and applied research in collaboration with sister organizations, leading to business incubation and development of economically feasible entrepreneurship models across the LBVC.

1.3 Livestock and Dairy Development (Pvt Sector) (Record Note, 26-28 Aug 2022)

Visited Office of Secretary LDD along with Mr Habibullah Nasir, Balochistan Policy Officer ITC. The delegates were welcomed. Mr Habibullah presented the background of the consultative process focusing on providing additional space for the private sector, gender lens, environment, ease of doing business and enterprise development. The International Trade Centre (ITC), a joint agency of the World Trade Organization (WTO) and the United Nations (UN), implementing the EU-funded 'Growth for Rural Advancement and Sustainable Progress' (GRASP) project, engaged Prof Subhan Qureshi as the National Consultant for developing the "Balochistan Livestock Breeding Policy 2022" (Figure 8).

The first output was completed through literature review and bad governance in the livestock sector was a major bottleneck in utilising the resources for prosperity of the people in the province in spite of having 52%, 22%, 41% and 11% of the national sheep, goats, camels and cattle population, respectively. The LDD Extension Wing is taking care of animal health and production, CASVAB is contributing in research and vaccine production, the Forest Department is taking care of the ranges, the Industries Department is responsible for SMEs development, Local Government Department is taking care of livestock markets and slaughter houses, and QCCI and Livestock Farmers Association (LFA) are taking care of the commercial producers and processors.

However, a lack of coordination and good governance has resulted in a meagre impact on development status of the livestock sector. Therefore, the Consultant proposed a GGM as an Academia-Industry-Government Nexus through establishment of LTQ, involving Departments of Forest, Industries and Local Government and five universities. The Consultant prepared a schedule for meeting with all the stakeholders to streamline the services to the livestock farmers and processors and provide an enabling environment for entrepreneurship development focused on generation of decent employment and exportable surpluses.

a. Visit to Commercial Dairy Farms in Quetta Suburbs

Mr Altaf Gujar, President Livestock Farmers Association (LFA) Balochistan, was contacted pursuant to advice of Mr Shakir Gujar, President Pakistan LFA, to visit nearby commercial dairy, sheep, goat and camel farms. Haji Dairy farm was visited near Dukani Baba, Bank Road (Raisani Road). Mr Nauman Gujar provided information on 200 HF and 100 buffaloes, milked 3 times a day with 3 milking machines serving two cows each at a time. The feed components provided were commercial and home-made feed concentrates, rice polishings, silage, soybean, wheat straw, common salt, Pro Milk, CowAPlus mineral supplement, LipAktiv L-Met 60 Rumen Protected L Methionine, Fubon Yeavita R feed grade live yeast, Biobon mycotoxin binder, Rindavital energy drink, refined sodium carbonate, Mega Fat 88 rumen protected fatty acid, Lipo En+ ketosis preventer, Bypass Glycols glucose precursor, commercial con and Pro-Milk milk production enhancer.

The farm owner Mr Abdul Basit, Vice President LFA, having BCom education, joined our discussion. He was working hard to maintain cleanliness and introduce various technologies. Mr Basit informed that Quetta city and the suburbs inhabit about 400 commercial dairy farms each having above 10 lactating animals. About 1200 veterinarians are working in Balochistan province; however, no program exists for integration of their services with the commercial dairy farms. Hence, the farms are left at the mercy of quakes, resulting in huge economic loss to the farmers. Dr Ghazan, Deputy Director LDD, met us during the farm visit and informed us that Bhagnari cattle of Balochistan is a unique beef breed weighing over 2000 kg and fetching a price up to the tune of Rs. 4.5 million in Sibi Cattle fair. He recommended propagation of this breed through Artificial Insemination (AI). He assisted us in visiting more commercial

dairy farms at bypass areas and discussions were held on the issues. The following issues were identified.

b. Lack of Service Delivery to the Private Farms

The qualified veterinarians working in the public sector remain on duty at the Civil Veterinary Hospitals. The Directorate General LDD supervises a network of civil veterinary hospitals (CVHs), artificial insemination centres (AICs) at district, tehsil and village levels. Semen Production Unit (SPU) and Animal Science Institute are located at Barori Road and Livestock Farms are located in various regions of the province. About 1200 qualified veterinarians with DVM degrees and veterinary assistants with diplomas are working at these institutions, however no system exists for registration and service delivery to the commercial peri urban dairy farms with pure or crossbred Holstein Friesian cows and buffaloes; sheep, goats and camel herds. Hence, these private livestock herds remain at mercy of the quakes. There were complaints that the commercial farmers have been relying on non-qualified practitioners, pretending to be veterinary doctors or veterinary assistants, the quakes like Mr Goga or others for getting technical help.

These quakes have damaged the dairy farms declaring pregnant animals as non-pregnant which showed advanced pregnancy when the valuable animals were disposed of through sale to the butchers. They also wrongly advised farmers to purchase butter oil (desi ghee) to the tune of Rs. 300,000 to a farmer for enhancing milk fat, while such results may be obtained through appropriate forage selection and fibre contents in the feeds of dairy animals. They usually prevent farmers from vaccination however, their ill advices are sometimes corrected by some of the qualified veterinarians who interact with the commercial farmers.

c. Breeding Services

The peri-urban dairy farms have been getting breeding services from some veterinarians, veterinary assistants and unqualified quakes. The semen produced at Semen Production Unit (SPU) is sold at Rs. 200 while in open market the rate is from Rs. 20-30 and such services are utilised by small farmers or disorganised commercial farmers. Commercial farmers, believing in quality and economic returns for high quality inputs, utilise semen from Maxim Agri Pakistan Ltd or ICI Pakistan Ltd, at a rate exceeding Rs. 5000 up to 10,000 per dose of traditional and sexed semen. The farmers are satisfied with the results of such semen.

d. Low-quality High-cost Farm Inputs

The farm inputs like medicine, vaccines, semen, feed concentrates, silages and other inputs are mostly lacking the desired quality and the cost is high. No system of analysing quality of the farm inputs like feeds for nutrients availability and presence of aflatoxins, is in place and the commercial dairy farmers lack any access to qualified veterinarians willing to respond to their challenges. Heavy abortions have been reported by Dr Ghazan in heifer which were found to be caused by soaked feeds, probably developing toxins.

e. Ungainly Loans

The farmers are usually short of money and the feed and milk dealers provide short term loans usually up to six months with higher interest rates like 50%. The farmers get no saving after being entrapped in such a vicious circle.

f. Price Capping of Milk

The prices of farm products like milk and meat are regulated by the district administration while the farm inputs are available under open market without quality or price regulation. The Livestock Farmers Association demanded fixation of milk rates in accordance with the production cost and appropriate profit thereof. Secretary Industry decided a rate of Rs. 135 and 111 for buffalo and cow milk, respectively, while the average production cost was Rs. 170. The Balochistan High Court was approached to provide relief to the producers.

A committee was constituted by DG LDD who found the production cost to be even higher. The Deputy Commissioner refused to accept the report of the Committee. Resultantly, the farmers have to bear the loss as the production cost of milk is higher than the rate of milk fixed by the Deputy Commissioner. The farmers and milk dealers selling pure milk at somewhat higher rates are punished by the administration with heavy fines and jails.

Due to the aforementioned reasons, the farmers have been facing huge economic losses and are intending to abandon the dairy business.

g. Policy Recommendations

Based upon the issued highlighted above, the following recommendations are suggested to be incorporated in breeding policy:

i. Herd Health Program (HHP):

FFP would be launched under the LTQ in LDD Department and affiliated organizations to provide special services to the registered commercial dairy, sheep, goats and camel farmers under an EF, with no repeated funding. An HHP Unit would comprise a veterinarian and 2 qualified veterinary technicians. The registration fees may be Rs. 20 per dairy animal per month against which an HHP veterinarian will visit the farm at two weeks intervals. Each HHP Unit would be provided Rs. 1 million revolving fund from EF by LTQ for purchase of farm inputs like high-quality low-cost medicine, semen, vaccine, feeds, silage, minerals and antioxidants. The farmers would be charged actual cost plus 10% profit to be paid to HHP, which is to be paid to the veterinarian at 4%, each of the two technicians at 2%, and 102% would be returned back to the revolving fund. Analytical services will be provided for feed quality, toxicology and disease diagnosis by CASVAB and other affiliated institutions.

ii. Postpartum Rebreeding and Feeding Plan (PRFP):

PRFP would be implemented at the registered farms. The high yielding A-grade cows, more than 30 litres per day, would not be inseminated for three observed heats or 100 days for postpartum, as such animals are under metabolic and lactation stress and may fail to conceive leading to metritis. For animals producing more than 25 litres, the breeding interval would be two missed heats or 80 days, and animals producing more than 20 litres would be bred after one missed heat or 60 days. The A-grade cows would be provided A-grade rations with sufficient energy, proteins, macro and micro minerals, bypass protein, bypass fats, amino acids and antioxidants. The B-grade cows would be provided a B-grade ration and the C-grade cows would be provided a C-grade ration with sufficient energy, protein and minerals. For buffaloes breeding, high quality bulls may be obtained from specified areas of Punjab province to improve the future generation.

iii. Price Control Committee (PCC):

A PCC would be constituted on permanent basis as follows:

- One representative of Director General Farms LDD
- One representative of Director CASVAB
- One representative of Director Small Industries
- One representative of Deputy Commissioner Quetta
- Two representatives of Balochistan Dairy Farmers Association

(PCC will assess the milk production cost per kg of milk at three commercial dairy farms located in different locations and add 15% as profit. The final rate will be notified by the Deputy Commissioner Quetta.)

iv. Salvage Farming (SF):

Peri-urban dairy farms lack sufficient space and inputs for calves to be reared in such expensive spaces. The buffaloes with declining milk yield and the new-born calves are sold to butchers, which is a loss to the dairy industry. Hence, such surplus calves and dry or pregnant cows and buffaloes may be reared in remote areas, preferably at SFs (Khan 2011) under a special arrangement by the EF of Livestock Technopark Quetta with the interested farmers.

v. E-marketing and Technical Services (EMTS):

EMTS would be introduced at the commercial farms for purchase of new animals and sale of culled animals, etc. An app would be developed for maintaining communication among the farmers, HHP officials and marketing partners through academia-industry linkages. Data of all animals at the farms registered with HHP would be computerised. Advisory services would be provided for managing health, fertility, feeding, rebreeding of the elite animals and culling of the inferior ones and finding appropriate buyers for the animals, milk, meat and other farm products. Clinical services would be arranged for the farmers under the HHP.

1.4 Forest and Wildlife Department (Record Note, 25 Aug 2022)

Visited Office of Secretary along with Mr Habibullah Nasir, Balochistan Policy Officer ITC, Mr Ghulam Muhammad Chief Conservator Forest, and Mr Ali Imran Conservator of Forests. The delegates were welcomed by the Secretary. Mr Habib presented the background of the process and the focus of ITC on ease of doing business, climate change and gender considerations (Figure 9).

Mr Ghulam Muhammad mentioned that livestock breeding is a prolonged process and need behavioural changes on part of the farmers. About 60% of feed requirements are met out of the ranges. Mr Ali Imran mentioned that the proposal of Range Regulatory Authority is in process through an act of the provincial assembly, which will cover different aspects of range development. Presently, the Forest Act has been in place after approved by the provincial assembly.

As per clause 36 (1) b, the provincial government may, by notification in the official Gazette, regulate or prohibit in any forest or waste-land, the pasturing of cattle. It is noted that grazing at such pastures may be regulated through rotational grazing for regeneration of grasses, herbs and shrubs, instead of total prohibition, to support the pastoral community. The policy suggests establishment of Livestock Entrepreneurship Development Centres with the support of sister departments, academia and the private sector for developing entrepreneurship models.

It was added that beyond the LDD, livestock stakeholders would also be supported through the Departments of Industries, Forest, Local Government and Universities. The Academia-Industry-Government Nexus would be selected as a GGM and LTQ would be established as an autonomous body at the University of Balochistan with regulatory, financial and administrative powers and an EF, represented by all stakeholders.

Relevant portions of the policy document were discussed and the integrated approach of the policy document engaging various departments, including Forest, academia and private sector stakeholders, were endorsed by the Secretary. Chief Conservator Mr Ghulam Muhammad was allowed as Focal Point for further inputs and implementation of the Policy.

1.5 Local Government Department (Record Note, 26 Aug 2022)

Mr Habibullah Nasir, ITC Policy Officer, communicated agenda to Secretary Local Government for discussion. The policy declares Balochistan to be suitable for meat rather than dairy production, on the basis of scarcity of water and fodders. The province contributes 52%, 22%, 41% and 11% of the national population of sheep, goats, camels and cattle, respectively. Qualitative improvement of the breeds is recommended instead of increasing the number of animals.

The status of livestock markets in the public sector may be improved and the private sector may be supported to add value to the existing markets and establish new markets as per need.

Community Centres of the Local Government Department would be allowed for hosting farmers training and demonstration of improved technologies and practices.

The university students would be facilitated in sponsored undergraduate internship and postgraduate thesis research on meat technology and marketing innovations in the remote rural areas, with the ultimate objective of generating decent employment and prevention of rural-to-urban migrations.

To support the integrated GGM of LTQ to be established as an autonomous body at the University of Balochistan with regulatory, financial and administrative powers and an EF, represented by all stakeholders including Local Government Department. The Secretary Local Government would work as Member Board of Governors LTQ.

Under intimation to the Secretary Local Government, office of the Quetta Metropolitan Administrator, Mr Jabbar Baloch, was visited by Prof Subhan Qureshi ITC Consultant and Mr Habibullah Nasir ITC Policy Officer. After detailed discussion, Mr Baloch agreed on establishing a Livestock Marketplace at Mashriqi Bypass to promote e-marketing, graduate students' internship and postgraduate thesis research, involving livestock marketing issues.

Facilities for the livestock traders and animals would be improved through joint efforts. E-marketing would be promoted through application of IT and involvement of university students, with the aim to protect the environment from frequent exposure to animal wastes and to provide e-market access to the local entrepreneurs. Community Centres of the Department would be used for farmers training and demonstration of entrepreneurship models. Mr Baloch ensured their institutional support for making the program a success story at the provincial and national level.

1.6 Industries Department (Record Note, 25 Aug 2022)

After having a courtesy call to the office of the Secretary LDD, and sharing the Visits and Consultancy Plan approved by ITC-UN, visited the Office of Secretary Industries Department along with Mr Shakoor Ahmad, Provincial Chief SMEDA, and Mr Habibullah Nasir, Balochistan Policy Officer ITC. The delegates were welcomed. Mr Habibullah presented the focus of ITC on ease of doing business, climate change and gender considerations. He suggested shifting the role of public sector organizations from overregulation to business facilitation of the stakeholders (Figure 10).

The Secretary inquired whether the status of the livestock sector is industrial, to which it was responded that presently the sector has not got industrial status as the farmers are just farming, without considering entrepreneurship potential of their assets. For the status of industrialization, we need to move ahead through regulatory development and SMEs support to the farmers and processors, which will make a fraction of the sector a documented economy producing traceable products for local and international markets coupled with generation of decent employment to the educated youth.

The Secretary advised the involvement of the field officer of Livestock and Dairy Development for serving the farmers as entrepreneurs. It was added that beyond the LDD, livestock stakeholders would also be supported through the Departments of Industries, Forest, Local Government and universities. Academia-Industry-Government Nexus would be selected as a GGM and LTQ would be established as an autonomous body at the University of Balochistan with regulatory, financial and administrative powers and an EF.

Relevant portions of the policy document were discussed and additional tasks for the Department of Industries, including Regulatory Support to LTQ and local and international linkages were agreed by the Secretary. Mr Akhtar Langov, Director Small Industries was allowed as Focal Point for inputs and implementation of the Policy.

1.7 University of Balochistan (Record Note, 1 Sep 2022)

A meeting was held in the office of Vice Chancellor, University of Balochistan on September 1, 2022 to finalise the consultation on Balochistan Livestock Breeding Policy 2022 under his chairmanship, attended by:

- Prof Shafiq ur Rehman, Vice Chancellor
- Prof Sayed Ainuddin, Pro Vice Chancellor
- Prof Muhammad Iqbal, Dean Life Sciences
- Prof Zafar Ahmad, Director CASVAB
- Dr Muzammil Bokhari, Director ORIC
- Dr Imran Taj, Assistant Professor CASVAB
- Dr Muhammad Shafi, Assistant Professor CASVAB
- Prof Muhammad Subhan Qureshi, National Consultant Livestock ITC-UN

The meeting started with recitation from the Holy Quran. The Vice Chancellor invited Prof Qureshi to present the policy outline. Reference was made to the International Trade Centre (ITC), a joint agency of the World Trade Organization (WTO) and the United Nations (UN), implementing the EU-funded 'Growth for Rural Advancement and Sustainable Progress' (GRASP) project, engaging Prof Qureshi as the National Consultant for developing the "Balochistan Livestock Breeding Policy 2022" (Appendix 2.10, Figure 15).

The Livestock Extension Department is taking care of animal health and production, CASVAB-UoB is contributing in research and vaccine production, the Forest Department is taking care of the ranges, the Industries Department is responsible for SMEs development and Quetta Chamber of Commerce and Industry (QCCI) is taking care of the commercial producers and processors. However, a lack of coordination and good governance has resulted in a meagre impact on development status of the livestock sector and quality of life of a common man.

Establishment of Livestock Technopark Quetta (LTQ)

A GGM was proposed as an Academia-Industry-Government Nexus through establishment of Livestock Teknokent Quetta (LTQ) at the University of Balochistan, to be hosted initially by CASVAB, then regularised under an Act of the Provincial Assembly as an autonomous body with regulatory, administrative and financial powers. LTQ would work under a Board of Governors, represented by members from the sister organizations.

Entrepreneurship models would be developed like livestock farms, dairy and meat factories, marketing outlets, diagnostic labs, training and consultancy centres, etc, through academia-industry interaction and propagated by LEDCs. Halal foods and biotech products would be produced for local consumption and export, associated with generation of decent employment.

The Vice Chancellor very kindly agreed on establishment of LTQ at CASVAB premises of the University of Balochistan as an autonomous, regulatory, financial, administrative and technical authority, as described below:

Board of Governors

- Vice Chancellor/Pro Vice Chancellor, Balochistan University, Chairman
- Secretary Livestock and Dairy Development Balochistan Co-Chairman
- Representative of Secretary Forest Balochistan Member
- Representative of Secretary Local Government Balochistan Member
- Representative of Secretary Industries Balochistan Member
- Director General Animal Health LDD or representative Member
- Dean Life Sciences, Balochistan University or representative Member
- Dean Veterinary and Animals Sciences, LUAWMS or representative Member
- Dean Life Sciences BUIITEMS or representative Member
- Dean Life Sciences, SBKWU or representative Member
- President Quetta Chamber of Commerce and Industry or representative Member
- Two commercial cattle farmers, two commercial sheep, goat and camel farmers; two each dairy and meat processors to be nominated by President QCCI (total 6) Members
- Director CASVAB, University of Balochistan Member/Secretary

Roadmap for the Establishment of LTQ

- Under this Mission, a GGM was proposed as an Academia-Industry-Government Nexus through establishment of Livestock Teknokent Quetta (LTQ) at the University of Balochistan, to be hosted initially by CASVAB, then regularised under an Act of the Provincial Assembly as an autonomous body with regulatory, administrative and financial powers. LTQ would work under a Board of Governors, represented by members from four government departments of Livestock, Forest, Local Government and Industries; four universities namely the University of Balochistan, BUIITEMS, SBKWU and LUAWMS; and QCCI.
- Entrepreneurship models would be developed like livestock farms, dairy and meat factories, marketing outlets, diagnostic labs, and training and consultancy centres, through academia-industry interaction and propagated by LEDCs. Halal foods and biotech products would be produced for local consumption and export associated with employment generation.
- The Board of Governors would oversee all the regulatory, financial, administrative and technical functions of the LTQ with a quorum of 50% and constitute supervisory bodies for its component units with sufficient local autonomy and transparency, regarding financial matters. The EF would be released to component units as per need and utilised as an operational fund with the intention of facilitating services to the registered farmers, processors and service providers as entrepreneurs, utilizing the spare lands, buildings, machinery and equipment. Investments made by different stakeholders would be assessed and they would be shareholders in the net profit on a proportionate basis through mutually agreed contract agreements. Regeneration of the EF would be ensured through investment in meaningful activities to continue the process of development in a sustainable fashion.

- The Centre of Excellence for Genetics of Animal Production and Health (CEGAPH) was agreed in principle and will be established at the University of Balochistan after completing the codal formalities at the level of university as well as the Higher Education Commission of Pakistan.
- LEDs would be established at Kharan Campus of the University of Balochistan.
- MoUs would be initiated with Konya Teknokent (Technopark) Turkey in continuation with those already signed by Pakistani counterpart during Fourth International Conference on Dairy Science Park at Selçuk University in 2017; and other international organizations to develop indigenous resources through academia-industry linkages.
- The Vice Chancellor endorsed the efforts made under this ITC Consultancy to bring a sustainable model of good governance as a ray of hope to engage the educated youth in exploring the indigenous resources for generating decent employment; exportable halal foods and biotech surpluses. Stakeholders were involved in this consultation process from various segments of the Society, covering the Government, Academia and the Industry.
- ITC-GRASP may push it further for approval from the provincial cabinet and attraction of sponsorship from the provincial and federal resources, international donors, as well as private investors. The Vice Chancellor offered his support for this Mission in the interest of the people of the province.

Background of the Establishment of LTQ

Establishment of Livestock Teknokents (Technoparks, LTs) were proposed by this National Consultant, pursuant to interaction with Konya Teknokent during the Fourth International Conference and Industrial Exhibition on Dairy Science Park (DSP) at Selçuk University in Konya, Turkey, in 2017 (jAppendix-3). The idea was endorsed by Prof Javed Iqbal, Ex-Vice Chancellor, University of Balochistan, and by the Governor of Balochistan during the presentations made by DSP Balochistan Chapter, and an MoU was signed between DSP and Konya Teknokent, copy annexed-2.

This National Consultant presented a paper on “Innovative Development Approaches in Dairy and Livestock; lessons learned and examples from other provinces and abroad”. SWOT analysis Livestock Sector Pakistan, Vision on Livestock Sector Development Balochistan; unpolished ideas and recommendations; Role of Government / Public Sector; Cooperation with private sector (livestock producers, traders etc) and Cooperation with input and services providers; Overview of and impact of Livestock Policies in other Provinces Pakistan; Livestock Teknokent in Balochistan and Roadmap and the way forward; who should do what, were included in the presentation available at <https://dairysciencepark.org/gg/>.

Functions

- An active and visible interaction among the academia, industries, government and the civil society, to provide feasible solutions to the emerging issues faced by producers, processors, service providers, marketing partners and consumers.
- Introducing farming innovations like introduction of biotechnologies, solar technologies, food technologies and bio-waste management.
- Development and replication of interlinked entrepreneurship models in livestock and poultry production, processing, marketing, quality control, diagnostics, veterinary clinical, processing and biotech products, marketing and legislative services; engaging university graduates as a source of decent employment and exportable surpluses; engaging SMEDA in entrepreneurship development.
- Improving and establishing slaughterhouses and meat processing facilities through joint ventures or public-private sector investment.

- Establishing a cold chain for transportation of milk, meat and by-products across district, provincial and national and international borders for meeting local and international marketing requirements and standards.
- Development of an environment-friendly and ethically sound transportation system for animals through public-private partnership or other models.
- Development and notifying standard operating procedures for quality control, food inspection and traceability of livestock-based food products, foods, feeds, medicines, vaccines, other biologics testing for local and international market; through registered laboratories in the public and private sector; the farm inputs available would be analysed for quality and price comparison and notified for reducing production cost and enhancing quality of farm products.
- Protecting financial, marketing, legal and public health interests of the stakeholders, especially the price regulation, across the LBVC and exemption of the registered entrepreneurs and institutional units from all types of taxations.
- Establishing common facilities centres for entrepreneurship inputs supplies, advocacy, training and marketing.
- Improving the livestock markets and introducing innovative technologies in marketing and communication among stakeholders to maintain quality standards, traceability, linkages with the local and international market and for harvesting new talent.
- Holding international conferences and industrial exhibitions on Livestock Transformation; workshops on bio risk management; collaboration with international organizations.
- Establishing disease free zones for various diseases through surveillance and quarantine across the district, provincial and national borders, qualifying products for exports.
- Removing bottlenecks impeding development of entrepreneurship models, across LBVC, to achieve and maintain self-sufficiency and efficiency in meat, milk and wool production, processing and marketing and providing feedback to administrative and legislative bodies for taking corrective measures to generate decent employment and exportable surpluses.

Centre of Excellence for Genetics of Animal Production & Health (CEGAPH)

CEGAPH would be established with the following functions:

- Identification of genetic markers for various survival and economic traits and stress resistance
- Studies on health, productive, reproductive and nutritional parameters of genetically improved breeds
- Investigations on fertility, growth, fecundity, stress, diseases resistance, wool, meat and dairy characteristics
- Genetic documentation of the local breeds at international levels
- Screening of imported animals and candidate breeding bulls for diseases, stress markers and economic traits
- Diagnostic services for bacterial, viral and parasitic diseases of economic and public health importance through molecular investigations
- Species identification and Halal certification of meat through molecular investigations

Livestock Entrepreneurship Development Centres (LEDC)

LEDCs would be established at district level, within a state institution or private firm and run as joint ventures under an EF as follows:

- The farmers would be provided an appropriate access to the farm inputs at accessible points and products sold through LEDCs; the Centres would be providing facilities of training, disease diagnosis, model farming and products processing, labelling and marketing facilities.
- Outgoing graduates at the universities would be provided facilities for internship and enthusiastic faculty members would be facilitated in demonstrating feasible entrepreneurship models.
- Hatchery services would be provided to the farmers for breeding of layers, quails, fancy and rare birds; quality of underground water would be checked for drinking of livestock to prevent emergence of different diseases.
- Facilities for cold chain and value addition of livestock products would be provided support to the farmers for enhanced profitability.

Endowment Fund (EF)

An EF would be established through provincial, federal and donors grants for developing entrepreneurship models as follows:

- The private sector would offer their land, animals, building and other assets for a period of at least 5 years with investment by LTQ and operational arrangements by private partners.
- The fund would be used for entrepreneurship development, for facilities required at various affiliated centres and for establishing common facilities and processing units.
- In addition to the EF, a non-lapsable development grant (NLDG) would be available to the tune of Rs.1.28 billion to support various activities of LTQ at the main centre and affiliated units. These funds will be generated through ADP/PSDP/special initiatives/donor's assistance or investment by the private sector at national or international levels. The funds will be allocated for infrastructure support of various activities approved by LTQ, focused at entrepreneurship development across LBVC.
- Net profit for each project will be shared on periodical basis as:
 - for on-campus new projects 10% to Government, 20% to the principal researcher, 39% relevant employees and worker, 30% to EF; and 1% to Insurance Fund;
 - for on-campus ongoing activity, the profit share would be 10% to Government, 30% to the staff and 60% to the EF;
 - for off-campus activities, the profit distribution would be 80% for the industry and 20% for LTQ and LTQ will pay honoraria to the relevant staff.

1.8 University of Information Technology, Engineering and Management Sciences (BUITEMS) (Record Note, 29 Aug 2022)

A meeting was held on 29th August, 2022 at the University of Information Technology Engineering and Management Sciences (BUITEMS) for consultation on Balochistan Livestock Breeding Policy 2022 participated by: (i) Prof Dr Nazeer Ahmed Dean Life Sciences; (ii) Prof Dr Subhan Qureshi National Consultant ITC; (iii) Prof Dr Muhammad Mushtaq; (iv) Dr Naveed Iqbal Durrani, Assistant Professor; (v) Dr Abdul Wajid, Assistant Professor; (vi) Dr Muhammad Asif, Deputy Director Research ORIC, (vii) Syed Usman Shah; Deputy Director ORIC; (viii) Syed Allah Dad Shah, Deputy Director ORIC; and Sahar Munir, Assistant Director, ORIC (Appendix 2.6, Figure 11).

The meeting commenced with recitation from the Holy Quran. Prof Dr Nazeer Ahmed, Dean, Faculty of Life Science & Informatics welcomed the members and started the Proceedings. At the outset Prof Dr Subhan Qureshi described the proposed Balochistan Livestock Breeding Policy 2022 project aims and objectives in detail and the importance of the project about livestock in Balochistan.

Prof Dr Nazeer Ahmed discussed the potential role of BUITEMS in fulfilling the objectives of the proposed project. Prof Nazeer highlighted the strengths of BUITEMS in the fields of Biotechnology, IT, bio surveillance, diseases diagnostic and Engineering matching the objectives of the project.

Dr Abdul Wajid and Dr Naveed Iqbal highlighted the detailed outline of scientific framework and active involvement in establishment and strengthening of animal's genetic resource and requirement including the animal house, cold room, transportation, and animal based on a specific laboratory at BUITEMS to accomplish the objectives of the proposed project.

Centre for Animal Health (CAH)

After thorough deliberations, following points were agreed upon:

- CAH will be established in the Faculty of Life Science and Informatics of BUITEMS and Halal Meat Research and Entrepreneurship Centre (HMREC/LEDC) would be established at Zhob Campus of BUITEMS, as components of LTQ, University of Balochistan. BUITEMS would nominate a member for the Board of Governors LTQ.
- The CAH will provide animal diseases diagnostic facilities, bio surveillance, monitoring and reporting of the disease in the province as follows:
- Special focus will be made on One Health concept considering livestock farming and farm products as a threat to public health and a source of 70% of human diseases.
- Biorisk Management initiative of the livestock breeding policy would be covered under mandate of this Centre through training of the farmers, butchers and other relevant workers in Biorisk Management.
- The ongoing project on fungus would extend their facilities for testing feeds utilised at livestock farms for presence of toxins at appropriate rates.
- A toxicology lab would be established to provide animal drug and chemicals testing facilities in the province.
- For surveillance and reporting of diseases and maintenance of health, productivity and business parameters of the animals at the livestock farms registered with LTQ, CAH will help develop a mobile app.
- BUITEMS will help in developing the Balochistan livestock census database.

Halal Meat Research and Entrepreneurship Centre (HMREC/LEDC)

HMREC/LEDC will be established as follows:

- HMREC will register sheep, goats, camel and livestock farms in the private sector located in Zhob and the surrounding areas and proceed further as follows:
- A team of LTQ would provide health and production services to the registered farmers.
- BUIITEMS would work on quality control parameters, traceability and certification of meat and milk, ultimately targeting at halal meat exports.
- The students of management sciences would work on the economic feasibility aspects of the farms.
- The students of the Social Science Department would work on the socio-economic aspects of the rural community and ethical and Halal aspects of meat. e. Engineering and Architecture students would work on low cost, energy efficient, environment friendly animal housing. DNA barcoding of flora of rangelands will be carried out in Balochistan Province, with special focus on grasses, herbs and shrubs used as animal feeds.

1.9 Sardar Bahadur Khan Women's University (SBKWU)

A meeting was held at Sardar Bahadur Khan Women's University Quetta on 29-8-2022 chaired by the Vice Chancellor Prof Sajida Noureen and attended by Acting Registrar Dr Raheela Manzoor, Director ORIC Dr Ayesha Gul, Assistant Professor Zoology Dr Zubia Masood, Media Manager Mr Abdul Hanan and National Consultant ITC-UN Prof Subhan Qureshi (Appendix 2.7, Figure 12).

The Vice Chancellor opened the discussion and invited Prof Qureshi to present the outline of the policy. Reference was made to the International Trade Centre (ITC), a joint agency of the World Trade Organization (WTO) and the United Nations (UN), implementing the EU-funded 'Growth for Rural Advancement and Sustainable Progress' (GRASP) project, engaging the author as National Consultant for developing the "Balochistan Livestock Breeding Policy 2022". Consultations were in process with four public sector departments of Livestock, Forest, Local Government and Industries, four universities i.e. BU, BUIEMS, SBKWU and LUAWMS and Quetta Chamber of Commerce and Industry including livestock farmers, processors, marketing and exporters' bodies.

SBKWU has been imparting education in the fields of Management and Social Science; Arts, Humanities, Basic Sciences and Life Sciences. Women professionals are inspired to be role models for the females in these areas and to develop linkages with the external world. Women may strengthen their leadership qualities so that they offer quality services based on the ethical value system within their communities. Opportunities are provided for research and development in areas of vital concern to the women of Balochistan.

The Policy would like to engage the faculty members and postgraduate students of SBKWU in entrepreneurship development across the LBVC while the undergraduate students would be involved through sponsored internships. Multidisciplinary studies may be conducted on the economic feasibility and entrepreneurship potential of livestock and poultry farming; reducing the cost per unit productivity and products quality through better management of health and productivity; processing of livestock products like milk, meat and eggs; diagnostic and quality control services and certification for hygienic and halal certification; products packaging; and access to local and international markets. The Vice Chancellor agreed on establishing LEDC-W at Nushki Campus of SBKWU.

Livestock Entrepreneurship Development Centre for Women (LEDC-W)

LEDC-W would be established at the Nushki Campus of SBK Women University as a component of the LTQ stationed at Balochistan University. Facilities would be provided for laboratory diagnosis of various livestock and poultry diseases and applied research will be conducted for postgraduate thesis on animal health and productivity issues through collaboration with sister organizations and Herd Health Program teams of LTQ. The Departments of Zoology may contribute in animal breeding and production; Department of Botany in fodder production; Department of Microbiology in meat quality analysis; Department of Environmental sciences in waste management, solar energy and biogas production. The Biotechnology Department may work on genetics, vaccinology; Pharmacy Department on medical plants investigations; and Department of Social sciences will work on farmers issues.

Dean Life Science will work as a member of the Board of Governors, LTQ; Dr Ayesha Gul as Focal Point and Dr Zubia Masood as Technical Coordinator of LEDC-W-SBKWU.

Expected Outcomes

- Training of undergraduates through sponsored internship and graduate students through thesis research in livestock's breeding and production to motivate them for entrepreneurship models, hence increasing employment opportunities for the youth.

- To support applied research in livestock and poultry to be published in high-ranking impact factor journals, providing social and economic benefits.
- To produce well-educated, trained and skilled women graduates belonging to different zones of the province who may lead the industry through establishment of an entrepreneurial network of model farms, factories, diagnostic, training and marketing centres, having visible impact on the provincial economy.
- To ensure availability of quality certified and traceable meat, milk, eggs and other animal products in the market at local, provincial and national level and export market, especially the Middle East in coordination with QCCI.
- To support the vulnerable family system in the province empowering women and men through enhanced income, improved education for kids, good quality diets and a better living standard for everyone in the family.

1.10 Lasbela University of Agriculture, Water and Marine Sciences (LUAWMS)

A meeting was held via zoom for discussing the Balochistan Livestock Breeding Policy 2022 on 5th September, 2022. The meeting was attended by:

- 1) Prof Dr Dost Muhammad Baloch, VC LUAWMS
- 2) Prof Dr Nasrullah Bangulzai, Dean FVAS
- 3) Prof Dr Ahmed Nawaz Khoso, Chairman ABG
- 4) Prof Dr Abdul Hameed Baloch, ABG
- 5) Prof Dr Ilahi Bakhsh Marghazani, Chairman Animal Nutrition
- 6) Prof Dr Muhammad Subhan Qureshi, National Consultant ITC-UN

The National Consultant presented the outline of the proposed policy and mentioned it a integrated approach of four public sector departments namely, Livestock, Forest, Local Government and Industries Departments; four public sector universities namely, BU, BUITEMS, SBKWU and LUAWMS; the Quetta Chamber of Commerce and Industry and associations of farmers, butchers, etc. Additional tasks were assigned to the public sector stakeholders with additional funding to explore new avenues in serving the people of the province through better utilization of the livestock resources. Comments of the participants were invited (Figure 13).

The Vice Chancellor appreciated the integrated approach to serve the farmers and processors within their specialised domains and urged upon a greater role for LUAWMS, being the sole DVM-degree awarding institution. Detailed discussion was held on the proposed programs to be launched at LUAWMS under the proposed policy. Later on, a draft was communicated to the National Consultant; on the basis of which, the following component is suggested for incorporation into the proposed policy.

Centre of Excellence for Biology and Entrepreneurship of Livestock (CEBEL)

In Balochistan, livestock plays a key role in the livelihood of inhabitants. In terms of contribution to the total strength at national level, this province shares 52, 41, 22 and 5% sheep, camels, goats and cattle, respectively. Livestock and Dairy Development Department, Balochistan has been providing services in producing and health management of livestock species in the province, however, the livestock production and research farms in the public sector could not get developed with the passage of time. It occurred due to lack of highly qualified human resource, funds and technology required for bringing the livestock sector in line with the recent trends.

Considering this, it is highly desired to establish the Centre of Excellence for Biology and Entrepreneurship of Livestock (CEBEL) at Sukken, LUAWMS, having 3300 acres. CEBEL fulfils multipurpose dire needs of the province i.e., awareness of modern infrastructure of dairy and fattening farms and recent trends in farming practices, products processing packaging, entrepreneurship, training services to farmers, veterinary assistants, veterinary officers, non-government personals; translational research on different aspects of livestock species, Feed, fodder production and demonstration to veterinary students.

Vision

CEBEL shall involve the highly qualified faculty members and postgraduate scholars of LUAWMS in exploring new dimensions of the livestock wealth of the southern regions of the province through sustainable development approaches, for generating decent employment for the youth and surplus halal meat and milk for the export sector.

Mission

Integrating the biological knowledge of animal health, management, nutrition, breeding and reproduction with the entrepreneurship development potential across LBVC.

The Components

1) Livestock Biology Division:

This division will focus on:

- Health indicators and diagnostic techniques for various bacterial, viral and parasitic diseases; control measures, ethno-veterinary practices and incorporation of recent trends of preventive medicine for indigenous and crossbred livestock of southern Balochistan in collaboration with sister labs.
- Genotypic and Phenotypic characterization of for indigenous and crossbred livestock of the southern Balochistan.
- Nutrition, feeds, fodders and range potential of the for indigenous and crossbred livestock.
- Reproductive management, stress physiology and breeding strategies for indigenous and crossbred livestock.
- Prevailing livestock husbandry and marketing practices of all breeds in Balochistan.

2) Entrepreneurship Development and Training Division:

This division will focus on:

- Economic traits of growth, fertility, stress resistance and production of meat, milk, wool, hides and skins and other products.
- Studying feasibility models for meat, milk and wool production on different feeding regimes and propagation through incubating startups.
- Value addition of meat, milk and other products through processing, preservation, labelling and marketing techniques.
- Training of potential entrepreneurs in demonstrated models.
- Addressing the technical, administrative and legal barriers across LBVC to reach the international market.

1.11 Quetta Chamber of Commerce and Industry (QCCI) (Record Note, 31 Aug 2022)

A meeting was held on 31st August, 2022 at QCCI with private and public sector stakeholders for Balochistan Breeding Policy 2022, participated by executive member of QCCI, representatives of Balochistan Dairy Farmers Association, Beef and Mutton Association, farm inputs suppliers, Pakistan Dairy and Cattle Farmers Association, Balochistan Women Business Association (BWBA), representatives of government departments of Livestock and Dairy Development (LDD), Environment, Environment Protection Agency, Small and Medium Enterprises Development Authority and International Trade Centre-GRASP. The meeting was chaired by Mr Jumma Khan Badezai, Executive Member Quetta Chamber of Commerce and Industry (Appendix 2.3, 2.4, 2.5, 2.8, 2.9; Figure 14).

The meeting started with recitation from the Holy Quran. Prof Subhan Qureshi, National Consultant ITC-UN, presented the agenda item, and the integrated approach of four provincial departments of LDD, Forest, Local Government and Industries; four Universities i.e., Balochistan University, BUIEMS, SBKWU and LUAWMS, the Quetta Chamber of Commerce and Industry and Farmers and Meat Associations. Close coordination between the livestock farmers, processors and marketing agents with the University faculty members, outgoing internees and postgraduate students would lead to development of entrepreneurship models. Such models would be propagated through LEDCs to be run by various component organizations. The whole setup would be working under LTQ controlled by a Board of Governors having representation from all the relevant organizations.

A member mentioned the ban of transportation of items across the Chaman border towards Iran as a bottleneck in the trade between the two countries. Most of the items may be imported at a lower rate from Iran and Pakistani items may be exported. Non availability of slaughterhouses in the province has prevented growth of the meat sector. Adulteration of milk and use of powdered milk for supplying milk to the market, is in practice. Chicks are being exported to Iran which are stopped at the border resulting in stress, disease occurrence and mortality of birds.

The members complained that no special service package is available with the government for resolving the health issues of commercial livestock farms. Another member emphasised the establishment of model livestock farms and meat and dairy factories under public-private partnership. An efficient information system is required to support the farmers and processors in getting technical and marketing services. It was mentioned by another member that CCI and the government department must support the livestock farmers and processors in growing their business and improving the products quality.

Fixation of the milk and meat rates at irrational levels was found to be an impeding factor for growth of livestock farming and processing. The price fixed by the district administration is far lower than the production cost of milk and meat. Smuggling of livestock at the borders with Iran and Afghanistan goes on without any documentation and regulation and supports bribery. The members identified the gap between the livestock industry, government departments and the universities as a bottleneck for growth of the sector. Lack of quality control practices across the food value chain was found as a threat to public health.

The members identified the gap between the public and private sector as a cause of underdevelopment. No subsidy exists, especially on food items with higher production cost. In China huge infrastructure was provided by the public sector, while in Pakistan the huge PSDPs, ADPs and donor assistance could not support such activities.

It was pointed out that although the country is the third largest milk producer at world level its benefit could not get passed to the national economy. The meat from Bhagnari cattle is the best and may be considered for export. However, the communication of transboundary diseases prevents such initiatives. It was mentioned that the organic meat produced in the province may be channelised towards local and international markets which is expected to fetch higher income. Such arrangements may be made through public-private partnership. The following recommendations were made:

- Livestock SMEs Support Cell (LSSC) will be established at Quetta Chamber of Commerce and Industry with an EF and non-lapsable development grant.

- The Cell will be responsible for e-marketing for which apps may be developed by relevant faculty members and postgraduate students of the affiliated Universities.
- The Cell will coordinate among various components of LTQ (four public sector departments of LDD, Forest, LG and Industries and the four universities of BU, BUIITEMS, SBKWU and LUAWMS) & SMEDA and provide solutions to issues.
- The Cell will maintain data of the registered farmers and processors and facilitate paid internship of the outgoing undergraduate students and thesis research of postgraduate scholars to provide solutions to the issues faced.
- The Cell will look for local and international investment at the state land.
- The Cell will explore international trade for livestock and livestock products.
- To utilise the strengths of the public service organizations in the province and get their inputs in pursuing the objectives of the Policy. Guiding Principle of the policy would be: On-campus development of entrepreneurship models; supported by Govt Departments, industry and civil society for building the entrepreneurship network; leading to Halal food export.
- To facilitate launching of mega projects on slaughter houses, hides and skins processing, cold storages, chilled transportation and chilled cargo services via roads, at the airport and the airplanes, as per need.
- To introduce quality control practices through sister organizations at all stages of LBFVC and certify the products for entering into the local and international market.
- To utilise the various activities across LBFVC for development entrepreneurship models involving the university graduates through the ORIC offices and SMEDA and facilitate registration of such companies.
- To introduce a Market-oriented Production Strategy.
- To establish Farmers Business Facilitation Centres in the remote areas and at the public and private sector organizations.
- Model farms and meat and dairy factories (MFMDF) may be established as public- private partnership models at state and private land and operated by the private partner on a shared basis of 80:20 for the private and public sector organization respectively.
- Herd health program (HHP) has already been suggested through Record Note of meeting with the commercial dairy farmers. It will make available qualified and enthusiastic veterinary and support staff to manage animals' health, feeding, fertility and marketing.
- Salvage farming (SF) has been suggested through the same record note for rearing of surplus calves and dry and pregnant cows and buffaloes of the commercial dairy farms at remote areas, under a special arrangement under the Livestock Technopark Quetta, with the interested farmers at state land under the EF.
- E-marketing and technical services (EMTS) would be introduced as already suggested through the Record Note of meeting with the commercial dairy farmers at the commercial farms for purchase of new animals and sale of culled animals, etc.
- A Price Control Committee (PCC) would be constituted at district level on a permanent basis to review and determine prices of milk, meat and other products at district level with the following composition:
 - One representative of Director General Farms LDD
 - One representative of Director CASVAB

- One representative of Director Small Industries
- One representative of Balochistan Food Authority
- One representative of Balochistan Environment Protection Agency f. One representative of Quetta Chamber of Commerce and Industry
- Three representatives of Balochistan Dairy Farmers Association h. Two representatives of Beef and Mutton Association
- One representative of Deputy Commissioner Quetta

(PCC will assess the milk and meat production cost randomly at farms of different sizes and located indifferent regions of the district, per kg milk and meat at three commercial dairy farms and livestock markets, located in different regions and add 15% as profit. The milk and meat will be graded as A, B and C and rates will be fixed accordingly on the basis of quality parameters. The final rate will be notified by the respective Deputy Commissioner.)

Appendix 2: List of Participants BLBP-2022

2.1 LDD Ext - 23 August 2022

Consultation Regarding Balochistan Livestock Breeding Policy

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1	HABIBULLAH	Policy Officer	ITC	03335236083		
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9						
10						

2.2. LDD (Res) - CASVAB - 24 August 2022

CASVAB
24/8/22

24/8/22
CASVAB


Consultation Regarding Balochistan Livestock Breeding Policy

S#	Name	Designation	Department	Contact	Email	Signature
1	Prof. Dr. Subhan Khan	Natural Cop. ITC	ITC	03005877923	drsubhan.khan@gmail.com	[Signature]
2	DR. MUZAMIL BOKHARI	Director ORIC	ORIC	03418096316	d.oric@um.edu.pk	[Signature]
3	Dr. Khalid Mehmood	Assistant Professor	Nutrition & Toxicology	03338349686	Khalidcasvab@yahoo.com	[Signature]
4	Dr. Abdul Samad	Assistant Professor	Microbiology	03023830654	Samad.casvab@gmail.com	[Signature]
5	Dr. Muhammad Ali	A/P.	BioTechnology	03148121991	drmdali@yahoo.com	[Signature]
6	DR. IMRAN TAJ	A-P	BioTechnology	0333-7940111 - Taj-Imran@yahoo.com		[Signature]
7	Dr. M. Azam Khan	Director LS		03337803175	adazgula@yahoo.com	[Signature]
8	Dr. M. Shafee	A/P	CASVAB	0334-3410545	shafeed73@gmail.com	[Signature]
9	Dr. Nadeem Rashid	AP	CASVAB	03332895956	nadeemuob@yahoo.com	[Signature]
10	DR. ZAFAR AHMAD	Director	CASVAB	03318323440	zafarcasvab@gmail.com	[Signature]


SPU
Dr. Kh. Ahmad D.D. L.N.P. Land
Dr. Foyeen M. DDET
Dr. Shaukat D.D. SPU


file enrolled/completed

2.3. List of Participants BLBP - QCCI - 26 August 2022 (livestock stakeholders could not participate due to heavy raining; hence general discussion was held with senior executives of QCCI regarding policy barriers across livestock farming, processing and trade activities and movement of animals, dairy, and wool products across the international borders with Afghanistan and Iran)



This project is funded by
the European Union








International
Trade
Centre

**Attendance Sheet
Consultation for Livestock Breeding Policy**

Date: 26/8/22 QCCI

S #	Name	Designation	Department/Organization	Contact #/ Email	Signature
1	Prof M Subhan	Asst	ITC	dr.msubhan@qcci.gov.pk	<i>[Signature]</i>
2	Engr. Imran Khan	Deputy Secretary	QCCI	03005877973	<i>[Signature]</i>
3	Jawhid Tawadun	Asst. Manager	SMEDA	0307-777624	<i>[Signature]</i>
4	HABIBUCCAM Khan	Policy Officer	ITC	03335231683	<i>[Signature]</i>
5	M. Cyril Walker	Senior Advisor	ICG	03218040780	<i>[Signature]</i>
6		President	QCCI		
7					
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2.4. List of Participants BLBP - LDD/QCCI - Commercial Dairy Farmers - 27 August 2022


This project is funded by the European Union

Attendance Sheet
Consultation for Livestock Breeding Policy

Date: 27/8/22 Dairy Farmers 27/8/22 Dairy Farmers visits


S #	Name	Designation	Department/Organization	Contact #/Email	Signature
1	M S Akbar	ITC			M Akbar
2	میرزا خان			03003825080	Mirza Khan
3	محمد خان			03013838437	Muhammad Khan
4	محمد خان			0342977604	Muhammad Khan
5	محمد خان			03342426571	Muhammad Khan
6	Abdul Aziz				Abdul Aziz
7	Abdul Shakir	300 cow, buff		03333454701	Abdul Shakir
8	J. I. Khan	10001-			J. I. Khan
9	IRFAN AKHTAR	Dairy Buff 150	Dairy Farm	03138336040	IRFAN AKHTAR
10	Haji Tahsin Khan	150 HF			Haji Tahsin Khan
11					

2.5. List of Participants BLBP - LDD/QCCI - Sheep farmers, wool factory, medicine dealers - 28 August 2022



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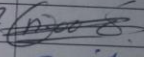
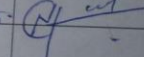




International Trade Centre

Attendance Sheet
Consultation for Livestock Breeding Policy

Date: 28/8/22 (Sheep farmers)

S #	Name	Designation	Department/Organization	Contact #/ Email	Signature
1	Nasir ul Haq	wool factory			
2	NAJEEB	MEDICINE DEALER	off CVH	0321 8110797	
3	Farooq Lalani	sheep farmer	Patrol Vet trader	0302 3869048	
4	Asif				
5	Asif			0307 3881133	
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2.6. List of Participants BLBP - BUITEMS - 29 August 2022






This project is funded by the European Union

Attendance Sheet
Consultation for Livestock Breeding Policy


Date: 29/8/22 BUITEMS 29/8/22


S #	Name	Designation	Department/Organization	Contact #/Email	Signature
1	Dr. Muhammad Asif	D-D ORIC	ORIC	03458300717 muhammad.asif@oric.gov.pk	
2	Naveed Iqbal (PhD)	AP-Biotech	Biotech, FLS&I	03342924663	
3	Dr. Abdul Waheed	AP-Biotech	Biotech, FLS&I	03344075315	
4	Engr. Syed Usman	Deputy Director	ORIC BUISTEMS QTA	0222-7872040	
5	Sahar Munir	Assistant Director	ORIC	0336-8309056	
6	Syed Qasim Abbas	Deputy Director	ORIC BUISTEMS QTA	0331-8055789	
7	Dr. Mohammad Akbar	Professor Emeritus	Biotechnology Deptt Faculty of Life Sciences	0333-2382444	
8	Prof. Naveed Ahmad	Dean	GSO-	03337808665	
9	Prof. Muhammad Saad	Dean	GSO-	03138744737	
10	Prof. M. Nasim	Dean	FBS		
11					

2.7. List of Participants BLBP - SBKWU - 29 August 2022



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the European Union

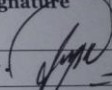
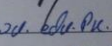







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Trade
Centre

Attendance Sheet
Consultation for Livestock Breeding Policy

SBKW-WU
Date: 29/08/2022.

S #	Name	Designation	Department/Organization	Contact #/ Email	Signature
1	Dr. Sajida Nansreen	V.C	SBKWU	vc@sbkwu.edu.pk	
2	Dr. Rakela	Acting Registrar	SBKWU	rakela.majeed@sbkwu.edu.pk	
3	Dr. Ayesha Gul	Director BRIC	SBKWU	director.oric@sbkwu.pk	
4	Dr. Zubia Masood	Asst. Prof Zoology	SBKWU	zubia.masood12@gmail.com	
5	Abdul Hanan	Media Cell	SBKWU	hanan.mirza@sbkwu.edu.pk	
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2.8. List of Participants BLBP - QCCI - 31 August 2022

This project is funded by the European Union

31/8/22
Date: QCCI

Attendance Sheet
Consultation for Livestock Breeding Policy




International Trade Centre

S #	Name	Designation	Department/Organization	Contact #/ Email	Signature
1	Dr. M. Gulshan	Lead National Consultant	IIC	0300587272	
2	Syedur Rahman	FE	SMEDA	2831623	
3	Said Raza	Balezi		0313 8366666	
4	Akhter Khas	Policy Officer	IIC GRASP	0333808888	
5	MABIDULLAH KHAN	Policy Officer	IIC GRASP	03335236083	
6	Abad Agha	Executive (M)	QCCI (M.C)	03337023896	
7	Mirwaise	Member	QCCI	0336-2300663	
8	M. Huzefa R.	Member		0336-8246886	
9	DR. GHAZAN KHAN	Deputy Director Dairy	L.D.D.D. Balochistan	03149991333	
10	ALFAR HUSSAIN GUJJAR	President Dairy Farm Association		0334244456	
11	Sareem Siddique	J/S. Beef & Mutton	BEAF & MUTTON Assoc	03320357911	
	12	M. Arifullah PR MUTTON ISSUES		03009384446	
	13	M. Arifan Gujjar Sectary Finance Dairy Farm Association		03458319383	
	14	Abdul Basir Gujjar Member Steering Committee D.C.F.A Pakistan		0333-7644445	

2.9. List of Participants BLBP - QCCI-2 - 31 August 2022

#	Name	Designation	Depos/009	cont	sig
	Enaid	Lab	Lab		
	Mr. Khayyaban	Secretary General			
	Mr. Naveed	Secretary General			
	Mr. Naveed	Secretary General			
	Mr. Naveed	Secretary General			
15	Mohammed Asif	Secretary General			
16	Wang Ali Asad	Member of committee			
17	Sana Durrani	Chairman / BABA			
18	Fazil Popalji	Member / BABA			
19	Engr. Imran Khan	Dy Secretary			
20	Mizan Ahmed Khan	CG Member			
21	Jamil Taseer	Executive Member			
22	Maji Javed Akhbar	Executive Member			
23	Dr. Mujeeb ul Haq	Director EDA			
24	Muhammad Yousaf Khan	Executive Member			
25	Syed Salam Shah	Executive Member			
26	Syed Najeeb ul Haq	Executive Member			

2.10. List of Participants BLBP - BU - 1 September 2022

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 International Trade Centre

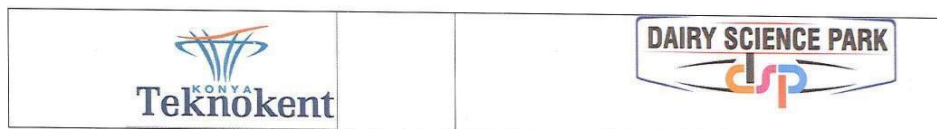
Attendance Sheet
Consultation for Livestock Breeding Policy

Date: *BU - 1/9/22*

S #	Name	Designation	Department/Organization	Contact #/ Email	Signature
1	<i>Dr. Saad Ahmad</i>	<i>pro-vc</i>	<i>UoB</i>	<i>03319082500</i>	<i>[Signature]</i>
2	<i>DR. Imran Taj</i>	<i>A.P</i>	<i>CASVAB</i>	<i>0333-7948111</i>	<i>[Signature]</i>
3	<i>Prof. Dr. Muhammad Iqbal</i>	<i>Prof. & Dean</i>	<i>U. G. B. Dept of</i>	<i>0333-7958494</i>	<i>[Signature]</i>
4	<i>Dr. Muhammad Shafiq</i>	<i>AP</i>	<i>CASVAB</i>	<i>0334-3410544</i>	<i>[Signature]</i>
5	<i>Dr. Myraiz</i>	<i>Director</i>	<i>ORIC - UoB</i>	<i>0341-8096326</i>	<i>[Signature]</i>
6	<i>Dr. Kayanahmad</i>	<i>Director CASVAB</i>	<i>CASVAB</i>	<i>0331-8323740</i>	<i>[Signature]</i>
7	<i>Dr. Shafiq ur Rehman</i>	<i>VC</i>	<i>UoB</i>		<i>[Signature]</i>
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Appendix 3: Copy of MoU between DSP and Konya Teknokent Turkey for Sustainable Entrepreneurship Collaboration through Academia-Industry Linkages



Memorandum of Understanding for

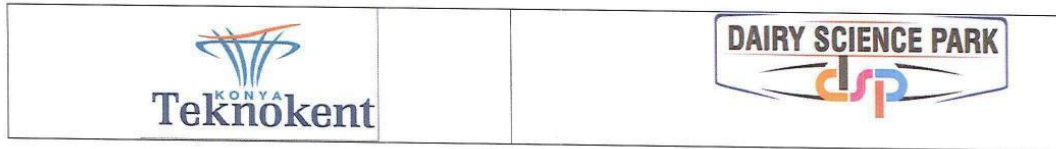
**Sustainable Entrepreneurship Collaboration
through academia industry linkages**

Between

Konya Teknokent, Konya, Turkey

And

Dairy Science Park, Peshawar, Pakistan



Memorandum of Understanding for

Sustainable Entrepreneurship Collaboration through academia industry linkages

Between Konya Teknokent and Dairy Science Park

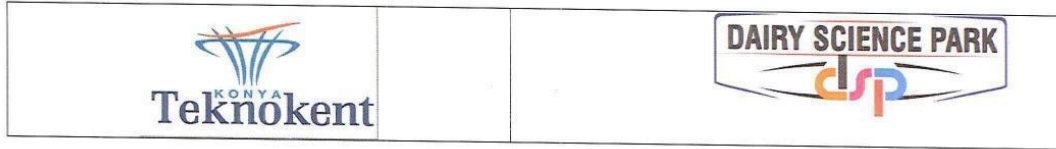
This Memorandum of Understanding ("the MoU") is made between:

Dairy Science Park, Peshawar (hereinafter referred to as "DSP"), a society registered under Societies' Registration Act XXI of 1860, emerged at the University of Agriculture, Peshawar, Pakistan, to support the people of the war-hit Khyber Pakhtunkhwa and the adjoining Afghan Regions through livestock entrepreneurship, public health safety, food security, and exportable surpluses. DSP delivers its services through its head office located at 401-A, City Towers, University Road, Peshawar-25000. DSP is governed by the Board of Directors supported by a Panel of Advisors, a Panel of Experts, Focal Points for Australia, China, India, Pakistan, Afghanistan, Turkey, the Netherlands, the USA, and Australia, and a network of veterinary practitioners, medium sized farmers, service providers, and marketing partners. The Panel of Experts is assisting the Board as well as the registered partners on various issues.

A series of International Workshops on Dairy Science Park has been in place. Three workshops were held in November 2011, 2013, and 2015, respectively at Peshawar, each one running for three days with 500+ participants from academia, industry, and government agencies of regional countries. The Fourth International Conference and Industrial Exhibition has been in place at Selçuk University Konya during Nov 1-5, 2017. Training programs are arranged on need basis in improved management practices, public health safety, and entrepreneurship development. Farmers' meetings are held in coordination with other service providers. A Biorisk Management program was completed with Sandia Laboratories USA with five meetings at Amsterdam Dubai, Bangkok, Phuket and Colombo training 60 academicians, entrepreneurs, civil society activists and policy makers. A module was developed for integration into Doctor of Veterinary Medicine degree and other life sciences in Pakistani Universities. AnMoU has been in place with Women University Mardan for Entrepreneurship development and Biorisk Management. Our goal is to develop capacity of young women and men in getting self-employment and producing hygienic food for domestic consumption and export.

And:

Konya Teknokent, Selçuk University, Konya which hosted the Fourth International Conference and Industrial Exhibition on Dairy Science Park 2017. A visit was arranged to Konya Teknokent of Selçuk University, mandated to provides important support to the production and service sector in terms of increasing competitive power, improving quality and productivity by producing new products, improved products, new technologies and improved technologies. As the continuation of the 7th Framework Program, the Horizon 2020 Program (2014-2020) encourages innovation in research and strengthen industrial-academia collaboration. Founded five years ago, Konya Teknokent has become one of the fastest developing technoparks of the country with its 107 firms in its field today. The Rectorate of Selçuk University has assigned Konya Teknokent to the Technology Development Zone of Selçuk University of 5000 m² in Alaaddin Keykubat Campus in order to start its activities immediately without waiting for Konya Teknokent to build its own buildings. Administration of the Konya Teknokent



appreciated the concept of Mardan and Quetta TechnoParks and assured their support to implement the initiative.

Purpose

Konya Teknokent and Dairy Science Park would collaborate through “Sustainable Entrepreneurship Collaboration through academia industry linkages (SECAIL)” for transforming the indigenous resources into useful services for the society.

Dairy Science Park

- Holding the biennial conferences and industrial exhibitions on Dairy Science Park in continuations to those held during November 2011, 2013, 2015 at Peshawar and during 2017 at Konya.
- Entrepreneurship development across food value chain certifying public health safety, and introduction of farming innovations, energy efficient and environmental-friendly housing, biogas, solar equipment, etc
- Consultative meetings of Biorisk Management Committee/stakeholders, training and research on the biohazards in the region as they relate to livestock and poultry production, value addition and marketing

Konya Teknokent

- Collaboration in Smart Energy programs
- Sharing success stories in food processing, quality control and marketing
- Sharing ARGE activities in Information Technologies, Agricultural Technologies, Biotechnology, Design Technologies, Environment and Energy Technologies and Defense Industries

Signed on this day: 22.11.2017



Prof. Dr. Birol DAĞ
General Manager, Konya Teknokent
Konya, Turkey
www.konyateknokent.com.tr

Engr Irfan ul Haq QURESHI
President Dairy Science Park
Peshawar, Pakistan
www.dairysciencepark.org.pk

Box-1: Entrepreneurship Development and Registration Pathways

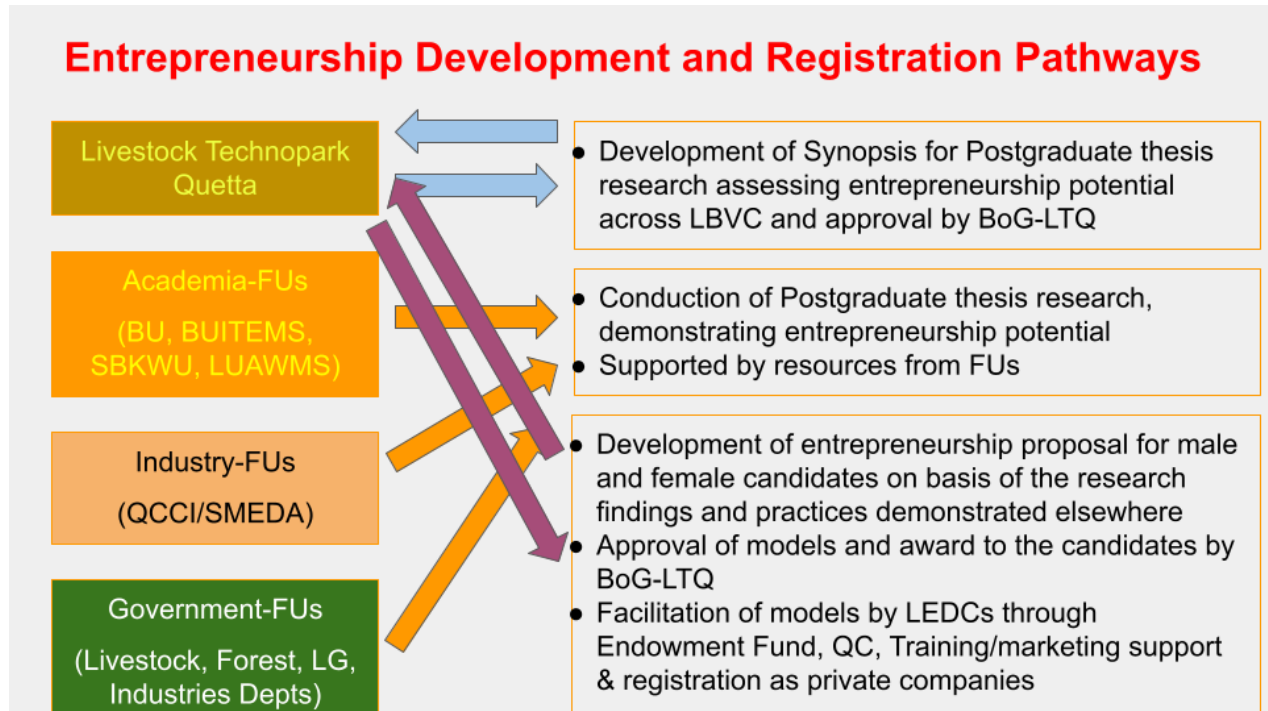


Table 1 Cost Estimate of Action Plan for Balochistan Livestock Breeding Policy 2022 (Rs. million)

S No	Component	End Fund	Non-laps Dev Grant	Total
1	Livestock and Dairy Development Department Ext (HHP/SPU/AICs/Camel R&D/LEDC Washuk, Khuzdar, Sibi)	210	260	470
2	CASVAB (Labs Accreditation, Vaccine development and applied research)/UoB (LEDC Kharan and CEGAPH)	210	250	460
3	Department of Forest (Livestock Entrepreneurship Development Centre Turbat)	120	80	200
4	Local Government Dept (LS Market Mashriqi Bypass, E-marketing, LS Community Centres, Students Internship, Postgraduate Research)	70	80	150
5	Dept of Industries (Livestock SMEs Regulatory Support Cell, LSRSC)	80	70	150
6	Livestock Entrepreneurship Development Centre/HMREC Zhob, BUIITEMS	70	80	150
7	CoE for Biology & Entrepreneurship of Livestock/CEBEL, LUAWMS	150	100	250
8	Livestock Entrepreneurship Development Centre Nushki, SBKWU	70	30	100
9	QCCI, LS SMEs Support Cell, LSSC	40	30	70
10	Livestock Technopark Quetta	700	300	1000
11	Grand Total	1720	1280	3000

Key to abbreviations: AICs: Artificial Insemination Centres; BUIITEMS: Balochistan University of IT, Engineering and Management Sciences; CASVAB: Centre for Advanced Studies in Vaccinology and Biotechnology; CEGAPH: Centre of Excellence for Genetics of Animal Production and Health; HHP: Herd Health Program; HMREC: Halal Meat Research and Entrepreneurship Centre; LEDC: Livestock Entrepreneurship Development Centre; LSRSC: Livestock SMEs Regulatory Support Cell; LSSC: Livestock SMEs Support Cell; LUAWMS: Lasbela University of Agriculture, Water and Marine Sciences; R&D: Research and Development; SPU: Semen Production Unit; UoB: University of Balochistan; SBKWU: Sardar Bahadur Khan Women's University; SME: Small and Medium Enterprises

Table 2: Policy Matrix BLBB-2022

SN	Policy Sections	Action Plan	Implementation responsibility
1	Farming to Entrepreneurship	6 Feeds Entrepreneurship Models 7 Sheep, Goats and Poultry Entrepreneurship Models 8 Livestock Entrepreneurship Development Centres (LEDCs) 13 SMEs Support Cells 15 Entrepreneurship Network	<ul style="list-style-type: none"> • LTQ and its functional units • Affiliated academic and government institutions
2	Farmers' and Processors' Empowerment	11 Livestock Technopark Quetta (LTQ/ Teknokent): Membership BoG/PCC	PMU-LTQ P&D Department
3	Integrating SDGs	13 SMEs Support Cells	Industries Department
4	Establishing Endowment Fund	11 Livestock Technopark Quetta (LTQ)	PMU-LTQ P&D Department
5	Establishing Functional Units (HHPs/LEDCs/HMR EC/CEGAPH/CEBEL/LSSC/LSRS C)	2 Herd Health Program (HHP) 3 Breeding Services 4 Postpartum Rebreding and Feeding Plan 8 Livestock Entrepreneurship Development Centres 9. Engagement of PSOs 14 Centre of Excellence	<ul style="list-style-type: none"> • LTQ/LDD Department • PMU-LTQ, P&D Department
6	Introducing Good Governance Model - Departmental to Integrated Approach	1 Policy Shift 5 Dev of Livestock Farms 9 Engagement of Relevant PSOs 10 Good Governance 12 PSOs Support	<ul style="list-style-type: none"> • LDD Department • PMU-LTQ P&D Department
7	Establishing Livestock Technopark Quetta	11 Livestock Technopark Quetta (LTQ/Teknokent)	• PMU-LTQ, P & D Department

Figure 1: The Livestock Resource-base, valuing about Rs. 1.5 trillion (LDD is helping in animal health and production under subsistence farming system while the entrepreneurship aspects got ignored)

The Livestock Resource-base



15.85 m	0.45 m	16.0 m	5.91 m	4.95 m
52.0%	41.0%	22.0%	8.02%	11.0%

(Total value Rs.1.5 trillions; provincial budget Rs.0.61 trillions)

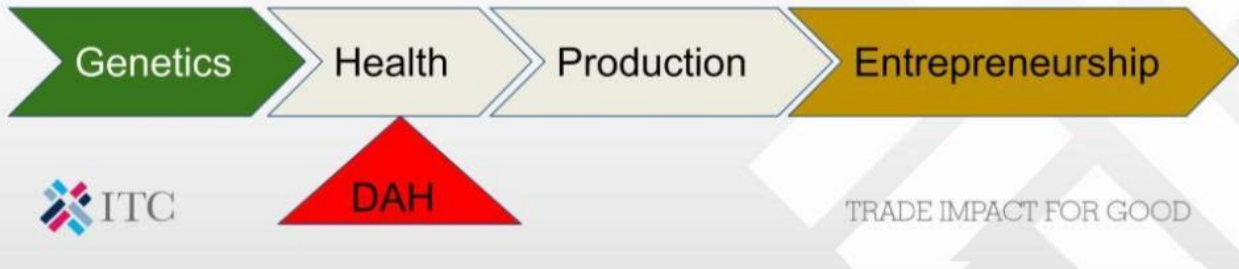


Figure 2: Good Governance Model – Academia-Industry-Government Nexus (The Triple Helix Model would involve LDD along with the 3 sister government departments of Forest, Local Government, Industries, 4 Universities, the UoB, BUIITEMS, SBKWU and LUAWMS and the private stakeholders through Quetta Chamber of Commerce and Industry; with focus on entrepreneurship development across Balochistan Livestock Based Breeding Value Chain)

Good Governance Model - Academia-Industries-Government Nexus



















ITC TRADE IMPACT FOR GOOD 9

Figure 3: Organogram of Action Plan of BLBP-2022 (Development of entrepreneurship models across the livestock breeding value chain is a gigantic task; hence a good governance model has been proposed with shared authority and responsibilities by the 9 public sector organizations under the umbrella of Livestock Technopark Quetta; with the concept of Endowment Fund to avoid repeated funding, centres of excellence to get solutions through advanced research and a network of livestock entrepreneurship development centres to provide a one window solution to the stakeholders)

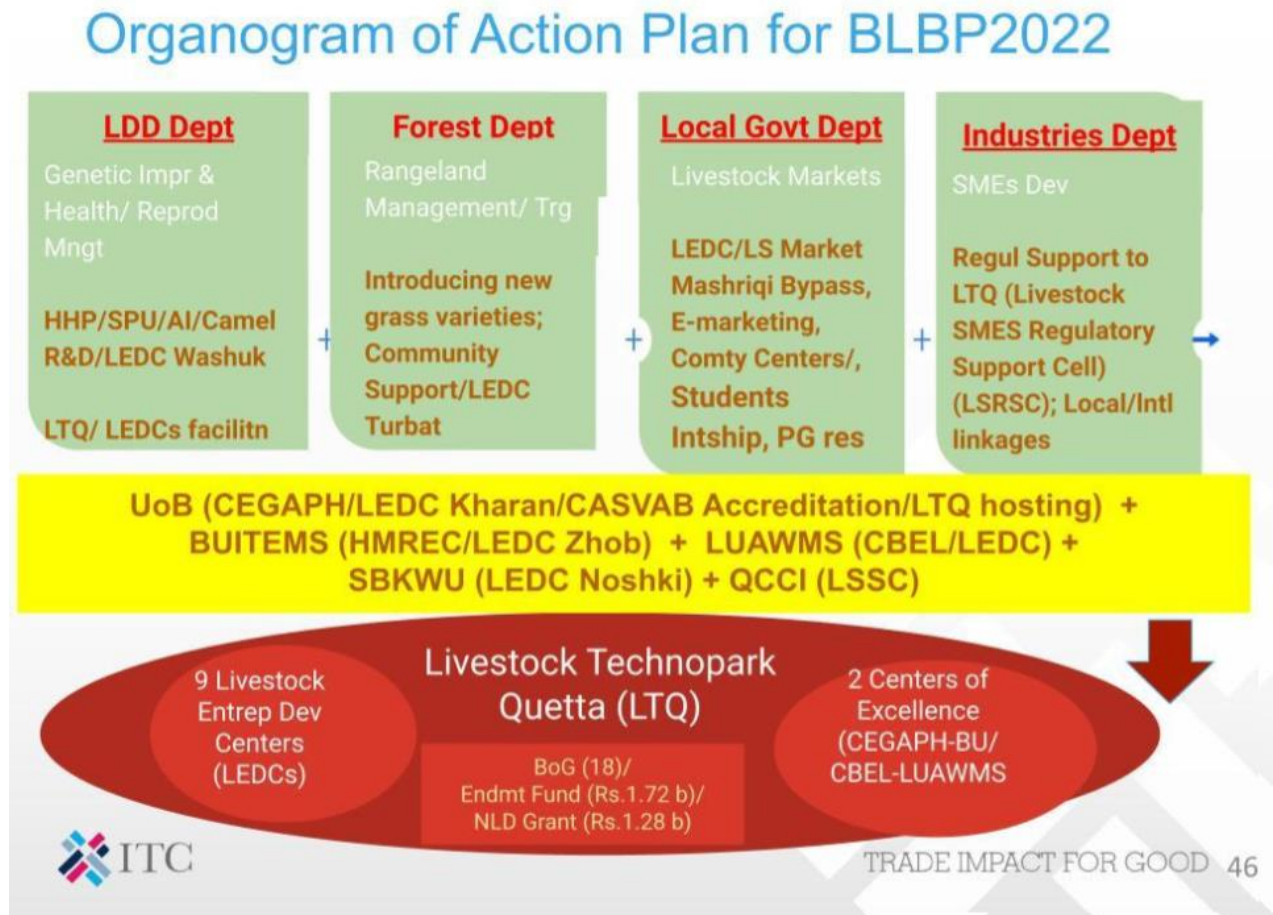


Figure 4: Livestock Entrepreneurship Development Centres (These would provide interactive points to the stakeholders for practising business incubation through transformation of applied research into viable entrepreneurship models; middle level enthusiastic faculty members would be provided opportunities to demonstrate feasible models in farming, value addition, diagnostic, clinical and lab analytical services, into entrepreneurship models and enthusiastic graduate would replicate such models and establish private companies)

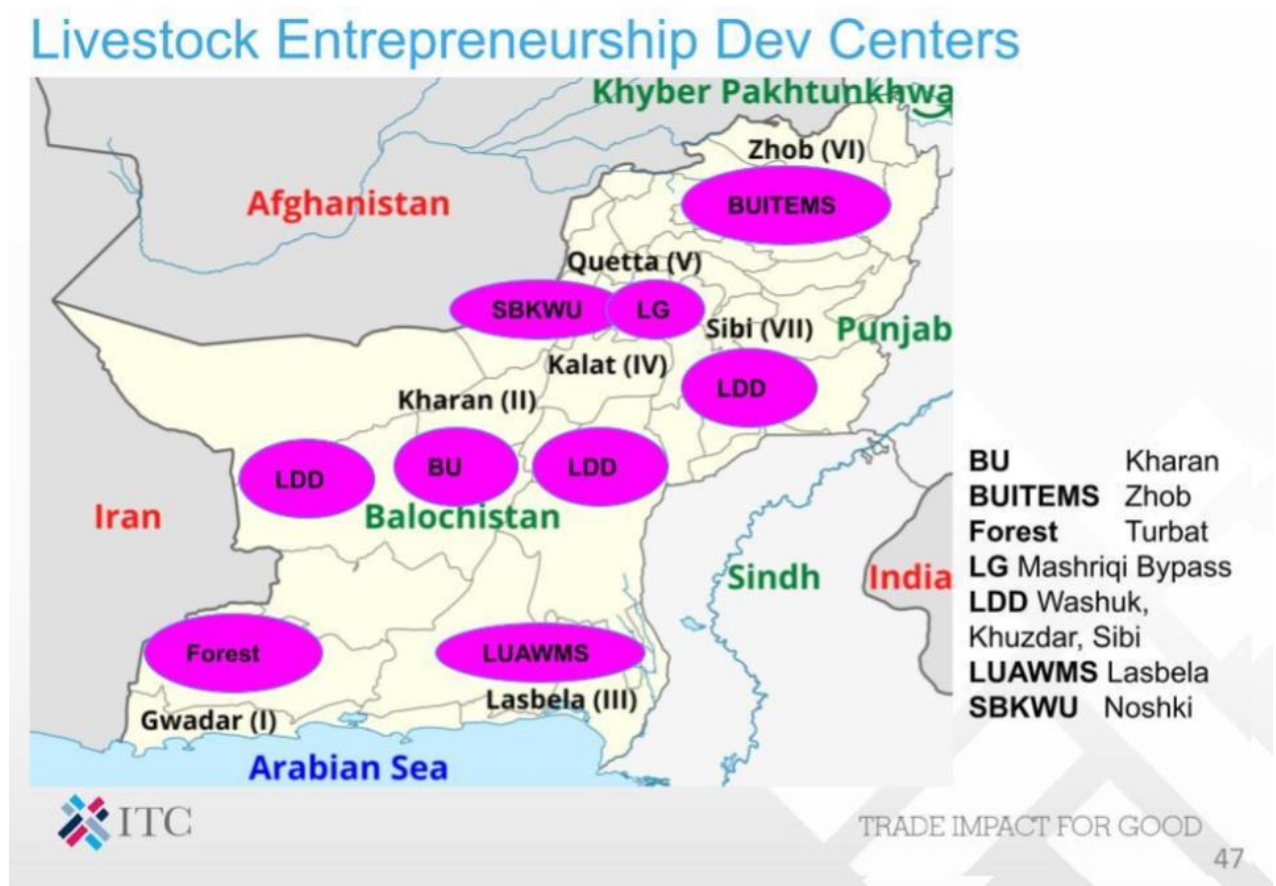


Figure 5: After 3 years (With successful implementation of this Policy and Action Plan it is expected that after three years we would be having Livestock Technopark in place with the cost of Rs. 3.00 billion; 250 farmers would be engaged; 25 meat factories would be established and meat worth Rs. 5.42 billion per annum would be produced out of which 10% may be exported)

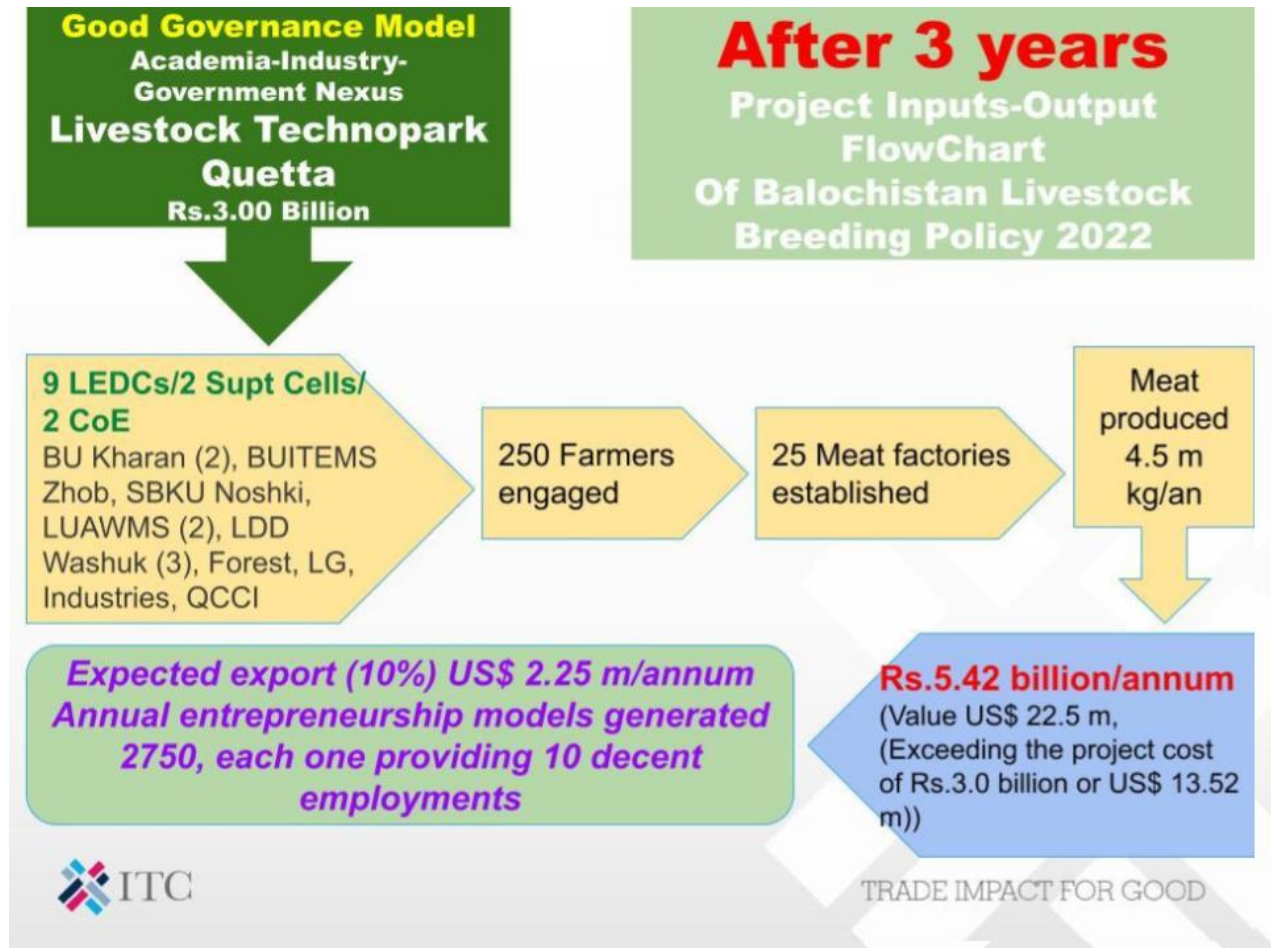


Figure 6: Discussion on Balochistan Livestock Breeding Policy 2022 at Directorate General Livestock and Dairy Development Department



Figure 7: Discussion on Balochistan Livestock Breeding Policy 2022 at Centre of Advanced Studies in Vaccinology and Biotechnology (CASVAB)



Figure 8: Discussion on Balochistan Livestock Breeding Policy 2022 with Mr Abdul Basit Commercial Dairy Farmer (Vice President LFA) and Dr Ghazan Deputy Director Farms



Figure 9. Discussion on Balochistan Livestock Breeding Policy 2022 with Secretary Forest, Government of Balochistan, Mr Imran Khan by ITC-UN Consultant Prof Subhan Qureshi, ITC Policy Officer Mr Habib Nasir, Chief Conservator Mr Ghulam Muhammad and Conservator Mr Ali Imran



Figure 10: Discussion on Balochistan Livestock Breeding Policy 2022 with Secretary Industries, Government of Balochistan, Mr Abid Saleem by ITC-UN Consultant Prof Subhan Qureshi, ITC Policy Officer Mr Habib Nasir and Provincial Chief SMEDA Mr Shakoor Ahmad



Figure 11: Prof Subhan Qureshi, National Consultant ITC-UN after discussion of Balochistan Livestock Breeding Policy 2022 at BUIITEMS



Figure 12 Discussion on ITC-UN Balochistan Livestock Breeding Policy 2022 between Vice Chancellor, Director ORIC, Dr Zubia Masood SBKWU and ITC National Consultant Prof Subhan Qureshi



Figure 13 Discussion on Balochistan Livestock Breeding Policy 2022 via Zoom meeting between Prof Subhan Qureshi, National Consultant ITC-UN, Vice Chancellor, Senior Executives and Senior Faculty Members of LUAWMS, Lasbela



Figure 14: Discussion on Balochistan Livestock Breeding Policy 2022 at QCCI under ITC-UN Consultancy



Figure 15: Discussion on ITC-UN Balochistan Livestock Breeding Policy 2022 chaired by Vice Chancellor, University of Balochistan



Figure 16: Back Cover (Under the Balochistan Livestock Breeding Policy 2022, an autonomous Livestock Technopark Quetta has been proposed, based on generation of entrepreneurship models through joint ventures of the Universities and Industry and support of such models through regulatory and institutional support of the government agencies leading to development of and entrepreneurship models and export of Halal Foods and Biotech products)

