# Dairy Science Park

## Society Profile - March 2026


*DSP established National Eco-Security System Pakistan at NESS Congress 2024, Shennongia, China*

## *Published by*

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# 1. DSP Vision, Mission and SDG Action

A society registered under the Societies' Registration Act XXI of 1860 (Reg. No. 4582/5/8589 dated 2-7-2015) by the Registrar Joint Stock Companies and Societies, Government of Khyber Pakhtunkhwa, Peshawar, Pakistan. Dairy Science Park is recognized as a Corporate Member of the KP Chamber of Commerce and Industry and has been accepted by the United Nations as an SDG Action (No. 40154).

## Vision

To support the people of Khyber Pakhtunkhwa, Balochistan, and the Northern Areas of Pakistan, as well as adjoining regions in Afghanistan, Tajikistan, and China, by promoting decent employment and exportable surpluses across the food value chain.

## Mission

Dairy Science Park collaborates with local, regional, and international stakeholders to transform indigenous livestock and renewable energy resources into sustainable economic opportunities. Through the Triple Helix Model of Good Governance (Academia–Industry–Government Nexus), DSP aims to generate decent employment and exportable surpluses, while ensuring that eco-security remains within safe limits. The mission of DSP ultimately contributes to the sustainable survival and well-being of children and humanity worldwide.

## SDG Action

Dairy Science Park (DSP) contributes to the implementation of the United Nations Sustainable Development Goals (SDGs) through an integrated approach linking food systems, renewable energy, entrepreneurship, and good governance. The initiative focuses on SDG-2 (Zero Hunger), SDG-3 (Good Health and Well-being), SDG-5 (Gender Equality), SDG-7 (Affordable and Clean Energy), SDG-8 (Decent Work and Economic Growth), and SDG-16 (Peace, Justice and Strong Institutions). Through its Triple Helix Model of Good Governance (Academia–Industry–Government), DSP promotes applied research, enterprise development, quality assurance of food products, and renewable energy solutions such as solar technologies developed under the SunSaviour startup initiative. These efforts aim to strengthen livestock-based livelihoods, improve food safety and nutrition, empower youth and women entrepreneurs, and foster transparent institutional collaboration for sustainable economic development and eco-security in Pakistan and the wider region.

# CONTENTS

## Annexures

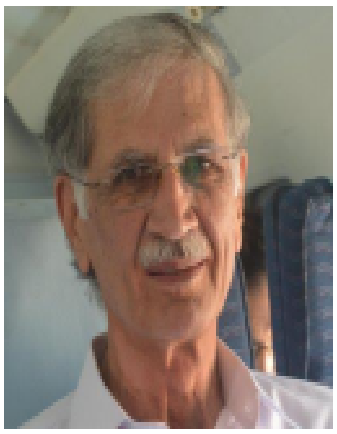
# 2. Endorsements

During my tenure as Chief Minister, I approved the Chief Minister Development Plan prepared by Prof Subhan Qureshi, which was later updated to Dairy Science Park through two international workshops held at the University of Agriculture, Peshawar, in 2011 and 2013, respectively. The Park has given birth to Peshawar Meat Company, which is to be implemented jointly by the University of Agriculture, Peshawar, the Department of Local Government and Rural Development, the Khyber Pakhtunkhwa Chamber of Commerce and Industry, the Small and Medium Enterprises Development Authority, and the Khyber Pakhtunkhwa Board of Investment and Trade.

**Sardar Mehtab Abbasi, Ex Chief Minister KP**

I was pleased to get an update on Dairy Science Park, presented to me as a Livestock Development Plan during my tenure as Chief Minister Khyber Pakhtunkhwa. The concept is commendable as it focuses on self-reliance through utilization of the livestock resources of the region and developing the export potential of these resources. The proposal has been updated to Dairy Science Park extending its activities to other organizations and linking the region with developments in ten countries, especially USA and China, in addition to the Pakistan Army. We would continue our support of DSP with the cooperation of national and international agencies, in the larger interest of the people.

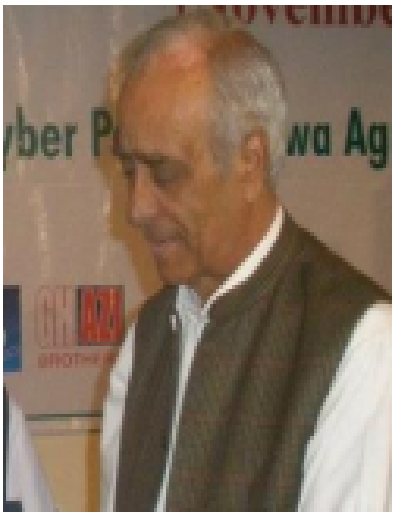
**(Akram Khan Durrani, Ex Chief Minister KP)**



The province of Khyber Pakhtunkhwa has been facing numerous challenges in the recent past affecting the socio-economic status of the people. The present government has decided to take concrete steps to revive the economy, pave way for huge investment, setup strong industrial base and promote tourism and trade activities in the province under a comprehensive plan. The novel step taken by the University of Agriculture supported by the provincial government departments, the Khyber Pakhtunkhwa Chamber of Commerce and Industry and SMEDA, is commendable. The Task Force on DSP has been an excellent model of out of box thinking. I hope that DSP will be successful in formulating a comprehensive strategy for developing the livestock resources for the welfare of people of this province. The provincial government will extend all possible support for making the Dairy Science Park a success story on the world map.

**(Mr Pervez Khattak, Ex Chief Minister KP)**

Dairy Science Park 2011 is a good attempt and attracted a good number of delegates from various universities and research and development organizations. Good livestock practices may be identified through the technical sessions for implementation in the field. The proceedings book has been produced as a beautiful document which will remind you of this august gathering. The provincial livestock department has been helping the farming community through extension and research wings with various assigned tasks for the benefits of the public. The efforts of the University were commended for successful conduction of this grand event. The feed mill and dairy technology units are success stories of the faculty which will help in improving the quality of degree programs and will encourage the local farmers and industry people for entering into the business.



**(Arbab Muhammad Ayub Jan, Ex-Senior Minister KP)**

I was pleased to work with the Dairy Science Park since the last several years. The Society has emerged at the University of Agriculture, Peshawar and has abridged the gap between the government and academia in policy development and bringing reforms in the Society in line with the vision of the present government. An ongoing project of Rs.200 million was included in ADP for establishment of Slaughter Houses. The development and private sector organizations within the country and abroad, are invited to participate in this sacred mission and collaborate in launching this novel initiative.

**(Inayatullah Khan, Ex-Senior Minister KP)**

I was pleased to inaugurate the Livestock Business Facilitation Desk of the Dairy Science Park at the KP Chamber of Commerce and Industries (KPCCI), Peshawar. The progress made under the Dairy Science Park with the co-ordinated efforts of the University of Agriculture Peshawar and KP Chamber of Commerce and Industries. The importance of the sector in jobs creation and food production may never be ingnored (Business Recorder, 26-5-2014).


**(Ikramullah Khan Gandapur, Ex-Senior Minister KP)**

I have been working with Dairy Science Park for several years. The UN has accepted their partnership for two SDGs. Their proposals for legislative reforms to protect the interests of stakeholders are worth consideration. The KP government would extend all possible support to achieve the goals set for bringing peace and prosperity in the Region. A Task Force for DSP would be established for establishment of the DSP Board in light of a wide-based consultation, Government of KP. The Task Force will identify and analyze the barriers in livestock and poultry production involving the stakeholders.

**(Arif Yousaf Advocate, Ex-Convener TF-SDGs, KP Assembly)**

The innovative idea of the Local Government Department regarding establishment of DSP could be appreciated to provide hygienic food production to the whole province. However, it is not clear that the KPDSP Park Board Act 2016 has been approved by the Provincial Assembly or otherwise. In addition, the detailed breakup of the total cost of Halal meat shall be required from an internationally recognized agency, which is not mentioned in the concept paper. Having registered under Society Registration Act XXI of 1980 as Dairy Science Park (DSP), it needs clarification that DSP, a non-profit organization, will work for enhancement of the marketing of the dairy product with the support of Agriculture University Peshawar and Local Government Department or Agriculture Department. DSP is similar in functions with Livestock Extension/Research, Agriculture Department and the Agriculture University Peshawar and their valuable input may be instrumental to avoid duplicity of functions. Business Recorder, 10 Jan, 2017.

**(Muhammad Azam Khan, Ex-Additional Chief Secretary GoKP)**

Consistency of DSP in arranging a biennial series of International Workshops on Dairy Science Park is commendable. Three workshops were held in 2011, 2013, and 2015 and more will be hopefully held. The industrial exhibitions attracted participation of manufacturers, marketing companies, government, NGOs, and private sector organizations. DSP has got international exposure, like the recent consultative meetings on Biorisk Management. We would like to incorporate such concepts into various curricula in biological, health, and environmental sciences at national level.

**(Prof Dr Mukhtar Ahmed, Ex-Chairman Higher Education Commission)**

I would like to congratulate the wonderful leadership that the DSP has provided for the livestock industries of KP. It is well recognized that most small-holder farming operations in this region depend on livestock as a source of meat, milk and fiber and also as a basis for the generation of income for their families. Their animals also serve as a mechanism for providing saleable assets to pay for family emergencies and celebrations. Seldom have the staff of a university based institute been so well integrated with their activities among farming communities, achieving great success in providing extension on animal nutrition, reproduction and health management. The frequency with which politicians rely on advice from DSP is developing policy for the management of livestock marketing/animal health services bears testimony to the pre-eminence of DSP and its staff. I feel proud of being part of the Park and would love to support it further.

**(Prof Peter Wynn, CSU, NSW, Australia)**

It was my most memorable moment when I met Prof. Subhan Qureshi in Egypt and found him to be a truly committed scientist with a deep empathy towards the livestock and dairy farming community of KP province. His deep understanding of the issue and aspiration to find innovative solutions can attract the attention of policy makers so that the needed resource base is generated to impact incomes and livelihoods of farmers as well as strengthen the scientific environment to benefit the students. As a development professional, I shared my experiences and we discussed the idea of DSP – an enabling platform which will bring all the stakeholders together to deliberate problems and issues and find sustainable solutions by optimizing resource use. We discussed the process out of my experience on Agri-Science Park and tried to embed the dairy and livestock sectors to it. Today I am glad that Prof. Subhan Qureshi has walked the talk by establishing DSP, which I believe is a global best practice. There isn't a similar platform on Dairy so far that I know of. Hoping to see you all in the next Int'l Conference on Dairy Science Park!!

**(Abdul Rahman Ilyas, ICRISAT, India)**

I remember my first consultation with Mr Abdul Rahman Ilyas during 2010 in Egypt, who suggested the name Dairy Science Park be given for our struggle to utilize the livestock resources of the region for the prosperity of the people. The interest of Sardar Mehtab Ahmad Khan Abbasi, Governor KP, during his tenure-ship as Chief Minister during 1998 motivated me to continue my struggle. Various provincial dignitaries supported us and Mr Inayatullah Khan took the message very seriously and pursued it through release of ADP funds and support of an autonomous DSP Board. The Chairman HEC, Prof Mukhtar Ahmad has been very kind in supporting DSP as the Center of Excellence.

**(Prof M Subhan Qureshi, President DSP/Ex-Dean FAHVS, UAP)**

# 3. The livestock Resources

Pakistan's Khyber Pakhtunkhwa, the former Federally Administered Tribal Areas (FATA), Balochistan, and the Northern Areas—collectively referred to here as the DSP Region—have historically been affected by international and regional conflicts. The region is largely mountainous and arid, yet it is rich in natural resources, particularly livestock, including sheep, goats, cattle, buffaloes, and poultry. The estimated total value of livestock assets in this region is Rs. 13.90 trillion (US $91.71 billion) (Tables 1 and 2 and Fig. 1).

Despite this substantial resource base, the livestock sector has not been able to generate adequate economic returns for producers or ensure the consistent supply of safe and high-quality food for consumers. Inefficient management and weak value chain integration continue to limit productivity and profitability, while poor handling and processing practices pose potential risks to public health and food safety.

Over the years, the livestock subsector has surpassed the crop sector as the largest contributor to agricultural value addition in Pakistan. According to the Economic Survey of Pakistan 2024–25, livestock contributes 63.6 percent to the agricultural value added and about 14.97 percent to the national GDP, demonstrating its central role in the country's food system and rural economy. During FY 2024–25, the sector recorded a growth rate of 4.72 percent, showing resilience despite climatic and economic challenges. Livestock also contributes approximately 2.9 percent to the country's total exports through trade in meat, live animals, and animal-based products. The sector provides livelihood support to more than 8 million rural households, contributing 30–40 percent of their income and playing a critical role in ensuring food security through the supply of high-value animal protein.

The importance of the livestock sector is further highlighted by its contribution to foreign exchange earnings, accounting for approximately 3.1 percent of total national exports. Moreover, livestock provides 35–40 percent of the income for more than 8 million rural families, thereby playing a critical role in rural livelihoods, food security, and the supply of high-value animal protein.

Despite its significant contribution to the national economy, the livestock subsector has historically attracted limited investment, largely due to its subsistence-oriented structure and fragmented production systems. Nevertheless, the sector demonstrated healthy growth of 4.0 percent in 2018–19 compared with the previous year.

Traditionally, livestock resources are managed by the Livestock and Dairy Development Departments at the provincial level. Their primary focus is on animal health services and breeding programs, delivered through veterinary hospitals at district, tehsil, and village council levels, with additional support from mobile veterinary clinics. Private veterinary practitioners also provide services to farmers with varying levels of professional capacity and reputation.

However, the current service delivery framework has several structural limitations. Veterinary services often generate revenue streams for both government institutions and individual service providers, which may inadvertently create a system

where disease management becomes routine rather than preventive, conflicting with farmers' interests who seek disease-free animals and stable economic returns to support their families. Furthermore, Annual Development Programs implemented by provincial departments are often not fully aligned with the practical needs of livestock farmers.

Provincial Veterinary Research Institutes and research centers function as diagnostic laboratories, research facilities, and vaccine production units. At the administrative level, Deputy Commissioners regulate the prices of livestock commodities, particularly milk and meat. However, the absence of quality-based price categorization discourages producers from investing in improved production and hygienic processing practices, as high-quality products often fail to obtain premium market prices.

In recent years, Food Safety Authorities have been established to ensure the supply of safe, hygienic, and Halal food products to consumers. While this initiative represents an important step toward improving food quality standards, enforcement practices have often focused on raids, heavy fines, and closure of facilities, rather than fostering a supportive regulatory environment for emerging small and medium enterprises in the food sector.

Livestock Farmers' Associations exist in the region; however, their participation in price determination, policy formulation, and the planning and implementation of development and research programs has remained limited. Strengthening the role of these associations could significantly enhance farmer representation, sectoral planning, and sustainable livestock development.

*Role of the Dairy Science Park*

Livestock development programs in Pakistan have historically focused largely on dairy production systems, particularly cattle and buffaloes, which are more prevalent in the irrigated plains of Punjab and Sindh. In contrast, sheep, goats, and camels, which are the dominant livestock species in Khyber Pakhtunkhwa, Balochistan, and the Northern Areas (Fig. 1), receive comparatively less attention in development initiatives. These species are well adapted to the arid and mountainous environments of these regions and represent an important source of meat production and rural livelihoods. Greater attention to the development of these livestock systems could significantly enhance the meat production potential and economic opportunities in the mountainous and water-scarce areas of the DSP Region.

Recognizing these regional realities, Dairy Science Park (DSP) promotes a value chain approach that integrates livestock species adapted to diverse ecological zones, supporting entrepreneurship, hygienic food production, and sustainable livelihoods in mountainous and arid regions.

Building upon this concept various interventions were made and proposals for the establishment of Livestock Technoparks have been developed to create integrated platforms linking research, industry, and government institutions. Under national consultancies conducted with the Food and Agriculture Organization of the United Nations (FAO-UN) and the International Trade Centre (ITC-UN), the establishment of Livestock Technopark Peshawar and Livestock Technopark Quetta was proposed to facilitate technology transfer, enterprise development, quality assurance of livestock

products, and value-added processing for domestic and export markets. These technoparks are envisioned as hubs for innovation, entrepreneurship training, and business incubation, enabling farmers, researchers, and private investors to collaborate in transforming livestock resources into sustainable economic opportunities while ensuring food safety and eco-security.

**Table 1. Livestock population of Pakistan and share of the DSP Region (million heads)**

| Species | 1976 | 1986 | 1996 | 2006 | 2025* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Pak | KP% | Bal % | NA % | DSP (% Pak) | Value DSP (Rs.billion) |
| Buffaloes | 10.6 | 15.7 | 20.3 | 27.3 | 45.0 | 7.06 | 1.17 | 0.0 | 8.23 | 1111.05 |
| Cattles | 14.9 | 17.5 | 20.4 | 29.6 | 59.74 | 20.20 | 7.61 | 1.4 | 29.19 | 3487.62 |
| Goats | 21.7 | 29.9 | 41.2 | 53.8 | 76.10 | 17.85 | 21,92 | 1.75 | 41.51 | 789.73 |
| Sheep | 18.9 | 23.3 | 23.5 | 26.5 | 33.10 | 12.63 | 47.96 | 2.40 | 62.98 | 1042.32 |
| Camel | 00.8 | 01.0 | 00.8 | 00.9 | 01.20 | 6.52 | 41.30 | 0.00 | 47.83 | 172.19 |
| Horses | 00.4 | 00.4 | 00.3 | 00.3 | 00.40 | 23.53 | 23.53 | 0.00 | 47.06 | 37.65 |
| Asses | 02.2 | 03.0 | 03.6 | 04.3 | 6.00 | 13.11 | 11.01 | 0.70 | 24.82 | 104.24 |
| Mules | 00.06 | 00.1 | 00.1 | 00.2 | O.20 | 43.75 | 6.25 | 0.00 | 50.00 | 8.00 |
| Poultry Domestic | 32.03 | 57.50 | 63.20 | 73.65 | 96.98 | 37.61 | 8.02 | 0.49 | 46.12 | 44.73 |
| Total | | | | | | | | | | **6797.53**** |

***Source:*** Economic Survey of Pakistan 2018-19; * Provincial share (%) is based upon Pakistan Bureau of Statistics 2006 and Northern Areas share on the basis of 1986 data; ** equivalent to USD 24.43 b.

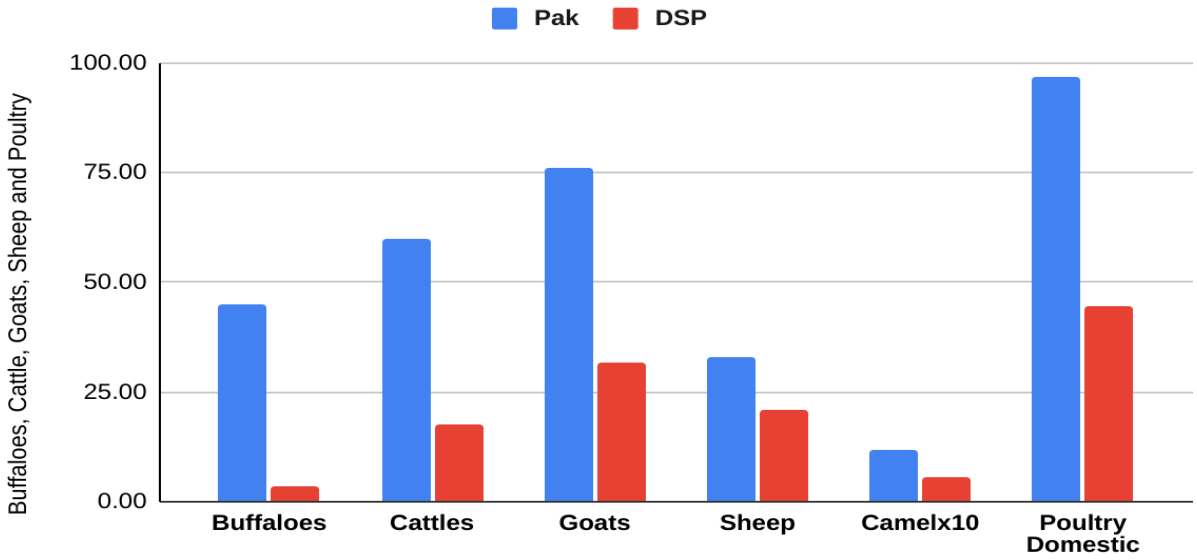
***Abbreviations:*** DSP, Dairy Science Park Region, representing KP, Bal and NA, requires special attention focused on meat production rather than the dairy production advocated by the national policy; Pak, Pakistan; KP, Khyber Pakhtunkhwa province; Bal, Balochistan; NA, Northern Areas

**Table 2. Livestock Production in Pakistan and the DSP Region during 2019***

| Production/ Species | Pakistan | KP | Balochistan | Norther Areas | DSP Region | DSP Value (PKR trln) |
|---|---|---|---|---|---|---|
| **Milk (b kg)** | **59.76** | **7.17** | **2.67** | **0.32** | **10.16** | **1,016** |
| Cow | 21.69 | 4.38 | 1.65 | 0.30 | 6.33 | 633 |
| Buffalo | 36.19 | 2.55 | 0.42 | 0.00 | 2.98 | 298 |
| sheep | 0.04 | 0.01 | 0.02 | 0.00 | 0.03 | 3 |
| Goats | 0.94 | 0.17 | 0.21 | 0.02 | 0.39 | 39 |
| Camel | 0.908 | 0.06 | 0.38 | 0.00 | 0.43 | 43 |
| **Meat (billion kg)** | **4.48** | **0.99** | **0.47** | **0.04** | **1.50** | **612.26** |
| Beef | 2.23 | 0.30 | 0.10 | 0.02 | 0.42 | 166.91 |
| Mutton | 0.73 | 0.11 | 0.26 | 0.02 | 0.38 | 305.13 |
| Poultry | 1.52 | 0.57 | 0.12 | 0.01 | 0.70 | 140.22 |
| **Total** | | | | | | **1628.26**** |

***Source:*** Economic Survey of Pakistan 2018-19; * Provincial share (%) is based upon Pakistan Bureau of Statistics 2006 and Northern Areas share on the basis of 1986 data; ** **(US$ 10.74)**

Fig.1 Livestock Population during 2024-25 (million)




**Footnote:** Pak= Pakistan; DSP= Dairy Science Park Region comprising KP, Balochistan and Northern Areas; Camelx10= value x 10, to be adjusted by dividing on 10.

# 4. Sector Issues and Impact

Despite the vast livestock resource base in the DSP Region, the sector has not been able to provide adequate economic returns to producers or ensure the consistent supply of safe and high-quality food to consumers. This situation is largely influenced by the poor socio-economic status of farmers, limited access to resources and technical support, and inefficiencies in the marketing and regulatory systems. The major sectoral challenges may be summarized as follows:

Production and education constraints: Traditional management practices at farm and industry levels, combined with limited entrepreneurship-oriented education and technical training, restrict innovation, productivity, and compliance with food safety standards.

Public health and food safety concerns: Many slaughterhouses and small poultry butcheries operate under unhygienic conditions where meat may be exposed to dung, flies, stray animals, and contaminated environments, posing serious threats to public health.

Underutilized human resources: High levels of unemployment and underemployment exist in rural areas, while a large number of workers engaged in livestock farming, processing, and marketing lack appropriate technical skills.

Market distortions, investment barriers and lack of institutional support: Administrative price controls on livestock products and weak market structures often discourage private investment and limit the growth of modern livestock processing industries. Medium-sized farms and emerging food processing units have significant potential for entrepreneurship and value addition; however, coordinated technical, financial, marketing, and regulatory support mechanisms remain limited.

Weak quality control and Halal assurance systems: Some private companies market milk and meat products of uncertain quality or unclear Halal certification, sometimes at inappropriate prices, which undermines consumer trust and fair competition. The transportation and marketing of live animals and poultry in open vehicles and crowded urban markets can contaminate the environment and create negative public perceptions.

Input supply challenges and disease monitoring: Livestock input suppliers often capture a large share of farmers' income while providing inputs of inconsistent quality, affecting farm productivity and profitability. Weak regulatory oversight may allow the marketing of dead or diseased animals and their products, raising concerns about hygienic and Halal compliance.

Inefficient utilization of livestock by-products, Regulatory and legal constraints: Valuable Halal by-products such as bones are often exported at very low prices, while products such as gelatin derived from non-Halal sources are imported at higher costs: Regulatory restrictions hinder the import of useful inputs or the export of valuable products.

# 5. Academic Strengths

***1. Institutional Foundation and Academic Programs***

The Faculty of Animal Husbandry and Veterinary Sciences at the University of Agriculture, Peshawar (UAP), has remained a cornerstone institution supporting the livestock sector through integrated teaching, research, and industrial outreach services. The Doctor of Veterinary Medicine (DVM) program, established in 2004, replaced the earlier BSc (Hons) Animal Husbandry degree. As a comprehensive and multidisciplinary program, the DVM curriculum encompasses both animal production and animal health sciences and is developed, monitored, and accredited by the Pakistan Veterinary Medical Council (PVMC) and the Higher Education Commission (HEC) of Pakistan.

The Faculty offers a wide range of postgraduate programs, including Livestock Management, Animal Nutrition, Animal Breeding and Genetics, Theriogenology, Pathology, and Poultry Science, leading to MSc (Hons)/MPhil and PhD degrees. These programs aim to develop highly skilled human resources capable of addressing national and global challenges in livestock production, animal health, food security, and public health. The Faculty also contributes to university governance through coordination and supervision of academic and allied activities.

***2. Teaching, Research, and Farm Infrastructure***

Teaching and research are supported by well-established infrastructure, including a University Dairy Farm, poultry production units, veterinary teaching hospitals and clinics (reproduction and surgery), a Semen Production Unit, a Feed Mill, and a Dairy Technology Center. The dairy herd includes Dutch Holstein Friesian, Australian Friesian, and Australian Jersey breeds, while broiler and quail units contribute to research and campus food supply. The Farms Block maintains dairy cattle, sheep, goats, broilers, and quails for experimental and commercial purposes. A modern hatchery produces day-old chicks, and dedicated land resources support forage research.

The Faculty maintains strong linkages with provincial research and development stations to enhance collaboration and technology transfer.

***3. Laboratory and Advanced Research Facilities***

Laboratory facilities are well developed across animal health and production disciplines, including microbiology, parasitology, pharmacology, and physiology. Advanced analytical tools such as spectrophotometry, ELISA, hematology, serology, and FT-NIR are available within the Faculty. Postgraduate research is further strengthened through access to PCR, gas chromatography, and other advanced technologies at collaborating institutions such as IBGE, PCSIR, and the University of Peshawar.

***4. DSP-Led Academic and Industry Integration at UAP***

At UAP, Dairy Science Park (DSP) has played a catalytic role in strengthening academia–industry linkages and revitalizing livestock-based education, research, and

enterprise development. Key interventions include the launching of a biennial series of international conferences and industrial exhibitions, focusing on revival of the dairy industry in the aftermath of the 2010 floods, sustainable meat production in arid and hilly terrains, and promotion of entrepreneurship in livestock farming, product processing, clinical services, and value chain marketing.

DSP facilitated the functionalization of the University Feed Mill through a lease arrangement with the private sector, demonstrating a viable public–private partnership model. It provided research support to the Poultry Science Department and the University Veterinary Teaching Hospital through revolving funds and aligned postgraduate research and graduate internships with industry-driven challenges. DSP also motivated faculty members to secure competitive research grants from NRPU (HEC), NSLP (PSF), and ASLP (PARC).

In addition, long-pending PhD research was revitalized through mentoring and coaching, resulting in the award of PhD degrees to more than ten scholars and the publication of numerous impact factor research articles. Several graduates have established entrepreneurship models based on their research, while others have advanced into professional careers in academia, industry, and public service.

***5. Biosecurity and Biorisk Management (BRM) Integration***

In line with global priorities in biosafety and One Health, DSP has developed a comprehensive Biorisk Management (BRM) package for integration into DVM programs across universities in Khyber Pakhtunkhwa and other provinces. Faculty members and students have been trained in BRM practices to ensure safe handling of animals and biological materials in teaching, research, and processing environments. This initiative enhances institutional capacity for disease prevention, protects both personnel and the public, and strengthens preparedness for emerging zoonotic threats.

***6. Regional Academic Ecosystem and Expansion***

Beyond UAP, regional academic institutions further reinforce the livestock education and research ecosystem. The College of Animal Husbandry and Veterinary Sciences at Abdul Wali Khan University, Mardan, offers DVM and MPhil programs with a focus on research, productivity enhancement, and food safety. The Faculty of Veterinary and Animal Sciences at Gomal University, Dera Ismail Khan, has been offering a five-year DVM program since 1996, supported by laboratory, clinical, farm, and hostel facilities, along with postgraduate training. The University of Veterinary and Animal Sciences Swat represents a significant advancement in veterinary education in the northern region. It is strategically positioned to serve livestock-dependent communities in mountainous areas and contribute to applied research, biodiversity conservation & climate-resilient systems.

***7. Contribution to Sustainable Development and Eco-Security***

Collectively, these academic institutions provide a strong foundation for human resource development, applied research, and innovation in the livestock sector. Their integration with Dairy Science Park enhances academia–industry–community linkages, promotes entrepreneurship, and supports sustainable livestock development aligned with national priorities and global frameworks such as One Health and eco-security.

# 6. Industrial Linkages

***1. Livestock Resource Base and Economic Potential***

The Faculty of Animal Husbandry and Veterinary Sciences recognizes Khyber Pakhtunkhwa as a significant natural resource base, endowed with livestock and poultry assets estimated at approximately Rs. 6.80 trillion, equivalent to USD 24.43 b. Meat production, in particular, represents a strategic opportunity to address national protein deficiencies while generating exportable surpluses valued at over US$ 2 billion annually. However, realizing this potential requires a shift from subsistence-oriented practices to an integrated, market-driven, and industrialized livestock production system.

***2. Dairy Science Park as a Platform for Industrial Integration***

An organized and sustained effort has been undertaken through Dairy Science Park (DSP) to harness livestock resources with a focus on industrialization and value chain development. A biennial series of international conferences and industrial exhibitions has been institutionalized under DSP, with successful events held in 2011, 2013, and 2015 at Peshawar, and in 2017 at Konya, Türkiye. Each event attracted more than 450 participants representing academia, government, and private sector organizations, thereby fostering knowledge exchange, technology transfer, and business linkages.

These platforms have focused on key thematic areas including post-flood revival of the dairy industry, sustainable meat production in arid and hilly regions, entrepreneurship development, and value addition in livestock products. The conferences have played a pivotal role in connecting researchers, investors, policymakers, and producers within a unified framework.

***3. Applied Research and Industry-Oriented Innovations***

Under DSP, academic departments have increasingly aligned their research with industry needs. The Animal Health laboratories have been actively engaged in diagnosing and investigating disease challenges faced by medium-sized livestock and poultry enterprises, providing practical solutions to farmers and industry stakeholders.

The Poultry Science Department has introduced innovative research areas in postgraduate programs, including the use of alternative protein sources such as maggot meal, silkworm meal, and mealworm; development of omega-3, iron-, and zinc-enriched eggs; and quality assurance through monitoring drug residues, aflatoxins, and antibiotic resistance. Research has also focused on herbal probiotics as growth promoters, improvement of meat quality through dietary antioxidants, stress management, semen evaluation, and artificial insemination. Emerging areas such as rabbit production for meat have also been explored for diversification of livestock enterprises.

***4. Livestock Production, Processing, and Value Addition***

Comprehensive studies have been conducted on sheep, goats, dairy, beef cattle,

and poultry to evaluate productivity, product quality, and business potential. Research on carcass yield, meat processing, palatability, and consumer preferences has supported the development of market-oriented production systems. Indigenous livestock and poultry breeds have been evaluated not only for productivity but also for their potential in business incubation and niche markets.

The Faculty has extended technical services to commercial farmers, promoting best practices in feeding, breeding, health management, and product handling. These interventions have contributed to improving farm productivity, product quality, and profitability.

***5. Public–Private Partnerships and Industrial Outreach***

A key milestone in strengthening industrial linkages has been the functionalization of the University Cattle Feed Mill through a lease arrangement with a private sector partner. This initiative has served as a practical model of public–private partnership, transforming a dormant facility into a hub for applied research, product development, and farmer outreach.

The Feed Mill has provided a gateway for integrating academic research with field-level application, enabling faculty members and postgraduate students to test innovations, obtain real-time feedback from farmers, and refine technologies accordingly. This approach has significantly enhanced the relevance and impact of academic research while strengthening trust and collaboration with medium-sized commercial livestock producers.

***6. Human Resource Development and Industry Engagement***

Industrial linkages under DSP have also contributed to human resource development by aligning postgraduate research and graduate internships with industry challenges. Students are exposed to real-world production, processing, and marketing environments, enhancing their technical skills, problem-solving abilities, and entrepreneurial mindset.

Many graduates, inspired through DSP interventions, have established livestock-based enterprises, while others have pursued advanced studies or secured professional positions in public and private sector organizations. This integration of education with industry needs has improved employability and fostered innovation-driven entrepreneurship.

***7. Towards a Sustainable Livestock Industry***

The industrial linkage model promoted by DSP demonstrates how academic institutions can act as catalysts for transforming the livestock sector into a dynamic, knowledge-based industry. By integrating research, education, and enterprise development, DSP contributes to value addition, quality assurance, food safety, and export competitiveness. This approach aligns with national priorities and global frameworks, including food security, economic development, and eco-security, and provides a scalable model for sustainable livestock industrialization in Pakistan and beyond.

# 7. Birth of Dairy Science Park

The concept of Dairy Science Park (DSP) traces its origin to 1980, during the formative years of Prof. M. Subhan Qureshi as a DVM student at UVAS, Lahore. A defining moment came through interaction with Meem Sheen (Late), a renowned journalist of the Pakistan Freedom Movement, who inspired a lifelong commitment to serve humanity with a purpose that transcends worldly achievements.

This vision was further shaped by the teachings of Dr. Israr Ahmad (Late), whose analysis of the Ummah's past, present, and future provided an intellectual and spiritual framework. Over time, this inspiration evolved into a life mission—to establish an initiative dedicated to socioeconomic uplift, later formally named Dairy Science Park (DSP) in 2010.

Guided by the Qur'anic principle:

"And We have not sent you, [O Muhammad], except as a mercy to the worlds" (21:107)

The humble efforts initiated under DSPM were supported generously by Mrs. Jamila Subhan Qureshi (Late), the wife of Prof. Qureshi. She shared his responsibilities with remarkable dedication, including raising the children, managing household affairs, and sustaining family life. She patiently supported his extensive engagement in official duties and his commitment to serving the weaker stakeholders of the livestock value chain.

DSP was thus conceived not only as a scientific and developmental initiative, but also as a family-supported mission rooted in sacrifice, compassion, and service to humanity—aimed at alleviating human suffering and promoting sustainable livelihoods through integration of knowledge, industry, and ethical values.

# 8. Chronological developments/Timeline of DSP

***Phase I - The Genesis***

**1980**

- Interaction with Meem Sheen, a famous journalist and an important organ of the Pakistan Freedom Movement; who advised me (DVM second year student at UVAS) to lead the Asar prayer as an Imam at Nasir Bagh Lahore. He told me that all of us will die and that I may prepare a gift to be presented before Prophet Muhammad SAW on the Day of Judgement.
- Attended TV Lecture Series of Dr Israr Ahmad analyzing the history, current status and future of the Ummah in light of Qur'an and Hadith.
- Developed my Life Motto as: Established my mission as "Dairy Science Park" (coined later on during 2010) to be gifted to Prophet Muhammad (SAW), as an attempt for socioeconomic support for the Third Revival of Ummah, as motivated by Meem Sheen; envisioned by Late Dr Israr Ahmad RA (Ahmad 1993) and supported by my wife, the Late Jamila Subhan Qureshi. This was a very humble attempt to implement the decree of Allah SWT communicated to the mankind through Prophet Muhammad SAW:

  (وَمَا أَرْسَلْنَاكَ إِلَّا رَحْمَةً لِّلْعَالَمِينَ)
  Wa ma arsalnaka illa Rahmatan lil alameen (And We have not sent you, [O Muhammad], except as a mercy to the worlds (Al-Qur'an: 21-107).

  Hence, I present my motto as follows: "Guided by the divine principles of Prophet Muhammad (SAW), sent to the worlds as a mercy by Allah SWT, I am committed to alleviating the burdens of people through initiatives at Dairy Science Park. My aim is to radiate as a beacon of hope and relief, seamlessly uniting earthly capabilities with spiritual insights."

**1994**

- Attended the 10th International Workshop on Swamp Buffaloes Reproduction at Chulalongkorn University, Bangkok, Thailand; visited FAO-UN Regional Center; looked at the resource utilization status of New Zealand, and other regional countries and realized the under-utilization of resources by Pakistan. In return I worked on dairy buffalo for my PhD thesis research.

**1998**

- Prof M S Qureshi completed PhD studies at UAF; wrote an article in Frontier Post, highlighting the unexplored export potential exceeding US$ 20 billion.
- Invited by Chief Minister KP, Mehtab Abbasi, for exploring livestock sector; Invitation Letter
- Dr-Shaukat-Report-on-CMLDP

- Livestock Development Plan was prepared on advice of the Ex-Chief Minister Khyber Pakhtunkhwa, communicated vide letter dated 8-1-2003 to Minister Livestock GoKP, for productive utilization of provincial livestock resources targeted at export.

**2003**

- Dr MS Qureshi' Development Plan endorsed by Prof Ch Shakat Ali (late) submitted to Governor KP -Risisted by Agric Department GovKP
- Livestock Development Plan prepared for KP and endorsed by provincial leadership, including the Governor and Chief Minister. However, implementation was resisted by bureaucratic inertia, reflecting institutional limitations in addressing resource utilization challenges and reluctance to forgo benefits associated with weak governance systems. The concept, nevertheless, gained attention at the federal level, where the President of Pakistan directed livestock sector development in line with Australia and New Zealand models. Subsequently, Prof. Qureshi was invited by Prof. Peter Wynn to join the Pak-Australia Dairy Project as Adjunct Professor at Charles Sturt University, Wagga Wagga, Australia, which he accepted.

**2010**

- Collaboration with CSU Australia
- Contributed at CSU Australia as Adjunct Professor
- Governor KP Awais Ghani concluded livestock training Workshop at Warsak
- Ideated and coined the phrase "Dairy Science Park" with Mr Abdur Rahman Ilyas, ICRISAT India, during Industrial Biotechnology Workshop at Alexandria Egypt in July 2010

***Phase II - International Conference Series and Institutionalization***

**2011**

- DSP I - 2011 Peshawar Inaugurated by Agriculture Minister and concluded by Livestock Minister
- DSP-KPCCI Linkages The Nation; Dawn;
- Arbab Ayub Jan, Senior Minister for Agriculture KP at Industrial Exhibition
- Feed Mill functionalized via lease arrangement
- Dairy Technology utilized for entrepreneurship development
- The Plan was updated to Dairy Science Park through three successive international workshops during 2011, 2013 and 2015 at the University of Agriculture Peshawar and 2017 at Konya, Turkey. DSP

**2012**

- Chief Minister Khyber Pakhunkhwa breifed on academia-industry linkages

**2013**

- DSP II - 2013 Peshawar; inaugurated by President KPCCI, VC AUP and Dean FAHVS at DSP 2013, Express Tribune

- The President Khyber Pakhtunkhwa Chamber of Commerce and Industries (KPCCI), approved the Standing Committee on Livestock for integrating various stakeholders (Business Recorder Nov 1).
- UAP-ASF Dairy Business Support Initiative launched
- KPCCI desk to facilitate investment in livestock - Dawn
- Establishment of abattoir in Peshawar okayed - Dawn

**2014**

- Local livestock marketing analysed at Peshawar
- Rabbits investigated as entrepreneurship model; Feasibility Report
- Quails investigated for enterprenureship; Feasibility Report
- Legislative consultation for enterprenureship development
- The Minister for Agriculture, inaugurated Livestock Business Facilitation Desk at KPCCI (Business Recorder, May 26). Dawn
- The Special Assistant to Chief Minister on Law, supported legislative reforms to protect interest of the stakeholders and commended acceptance of the Park by the United Nations As SDG Action 40154.
- Govt to create self-employment opportunities for youth - Dawn

***Phase III - Biorisk Management, Entrepreneurship Development and Policy Interventions***

**2015**

- DSP III - 2015 Peshawar; Inaugurated by Senior Minister LGE&RD and concluded by Arif Yousaf, Mohibullah & Jaffar Shah MPAs
- DSP CEBG Collaboration
- BRM-I-Amsterdam
- DSP Collaborates with CAAS China
- Silage introduced in KP through DSP
- Special Assistant to CM KP (Livestock) endorsed DSP; The Special Assistant to the Chief Minister on Livestock, supported the plan for preparing the province for International Halal Meat Market and advised for development of a policy to address the current challenges (UAP Coverage).
- The DSP head office/Display Center has been established at the City Towers, University Road Peshawar and the Park has been registered under Societies' Registration Act XXI of 1860.
- A collaborative arrangement was agreed with CEBG, Pakistan Army for utilizing the semen and embryos from elite dairy and beef ruminants at the medium sized farms in the province and FATA.
- A collaboration on "Biorisk Management" was initiated with the Sandia National Laboratories USA. A four-members' delegation of the Park visited the Netherlands in March 2015 for launching the initiative and attending Third One Health Congress at Amsterdam. Workshops were held at Dubai, Bangkok, Phuket, Colombo, Konya, Amman, Dubai-II, training 104 persons-times from academia, government and the private sector and preparing a curriculum package for integration into DVM degree

program. A Biorisk Management Curriculum Package for DVM degree was developed at Colombo in 2017.

- An MoU was signed with the Khyber Institute of Veterinary Sciences, Peshawar for collaboration in livestock entrepreneurship development (LED).
- A letter of intent was signed in August, with the Chinese Academy of Agricultural Sciences for collaborative research on development and trade of Halal products.
- Focal Persons were appointed for the Park for Australia, China, India, Pakistan, Afghanistan, Middle East, Turkey, Netherlands, USA and Canada.

**2016**

- Experts Consultation: Price Capping damage Livestock Industry
- Senior Minister LGE&RD agreed on DSP Board Business Recorder
- Jan Arcade Meat Shop certified for quality maintenance
- Royal dairies started functioning
- Farmers Sausages DSP
- Dairy Science Park Innovations (DSPI) launched Dairy Science Park Innovations (DSPI) registered as a private firm, with GoKP vide number 1324/9/30055 dated 26-1-2016. Engr Irfan ul Haq Qureshi has been running the firm as Chief Executive Officer.
- Silage plant established by Mr SA Kamal Khan
- Biorisk Management Workshop held at Dubai
- HEC Chairman appreciated University Industry Linkages for Feed Mill operation and accepted DSP as Center of Excellence
- Livestock policy formulation was hosted by DSP
- Chairman HEC supervised DSP-KMU-HEC MoU
- DSP Society Profile endorsed to Governor, CM, Sr Minister LG, Spl Assistant to CM Law/Livestock, Secretaries
- The Senior Minister for Local Government and Rural Development, Mr Inayatullah Khan allocated Rs.200 million for establishing a model slaughter house in consultation with the Park.
- The Senior Minister advised that an autonomous DSP Authority may be established under the supervision eminent academicians, and representatives of the Government, industry, farmers and civil society, focused at the burning issues of self-employment and hygienic food production.
- An MoU was signed with the Khyber Institute of Veterinary Sciences (KIVS), Peshawar for Enterpreneurship Development.

**2017**

- Chief Minister KP approved the Task Force on Dairy Science Park, proposed by Senior Minister Local Government GoKP on advice of Prof Qureshi and endorsed by Additional Chief Secretary GoKP. The same was endorsed to, the Secretary Agriculture for implementation.
- DSP SBBU Sheringal signed MoU
- BRM-4-Pukhet
- MoU with Women Univ Mardan

- A Beacon of Hope -DSP's Model Entrepreneur
- Peshawar Meat Factory established as a DSP Startup
- BRM-5-Colombo; BRM-6/DSP-IV 2017 - Konya
- Governor Balochistan supported DSP
- DSP delegation visited Konya Teknokent
- Entrepreneurship Show 2017 Mashad; Pak-Turk-Iran Entrepreneurship Nexus proposed at ST+ Mashad; Connected Iranian and Turkish organizations
- KP Assembly briefed on DSP
- Agricultural varsity, Dairy Science Park chief at loggerheads - Dawn
- Fourth International Conference and Industrial Exhibition for Dairy Science Park was held at Selcuk University, Konya, Turkey and an MoU was signed with Konya Technopark for research and development linkages.
- Academia, industry join hands for supply of hygienic meat
- Turkey to help build capacity of farmers
- KPCCI highlights investment opportunities in livestock sector - The Nation

**2018**

- Dr Subhan accuses KP officials of threatening farmers
- Collaboration agreed with KP Chamber of Agriculture
- BRM-7-Amman
- At Khyber TV
- Meeting with butchers and QC Services
- Chairman PARC supervised MoU with Turkey
- MoU with SU Jamshoro and Reproduction Workshop at SAU Tandojam; Therio Session at SBB UVAS Sakrand
- AUP Management, DSP Chief Patron at loggerheads
- Resistance to Policy Reforms - VC UAP victimizing academician of repute

***Phase IV - Phase IV – Expansion, Challenges & Technopark Vision***

**2019**

- Salary of Prof Qureshi President DSP stopped by UAP administration; Peshawar High Court provided relief to Prof Qureshi; but his wife died due to victimization of the family.
- Judgement PHC - Prof M Subhan Qureshi TTS to BPS
- FAO selected Prof Qureshi as National Consultant Livestock and report title, "Transforming Livestock Resources into a Beacon of Hope through a Good Governance Model"; Assisted in FAO Balochistan Livestock Policy
- Livestock Entrepreneurship Development Initiative (LEDI) launched at Quetta CCI
- DSP Balochistan Chapter established
- Complaints at Prime Minister's Citizen Portal ***Response to the Complaint***
- Peshawar High Court approached for release of salary - HRC PHC
- Judgement of Peshawar High Court in milk theft allegations

**2020**

- Good Governance and Conflict of Interests
- Science and Technology Park Peshawar proposed to GoKP
- Suggested establishment of Quetta Technopark

**2022**

- B2B Negotations with State Technopark Tatarstan
- COC Judgement in Judgement of WP No.5127-P/2018 of Prof M Subhan Qureshi against the University of Agriculture Peshawar (UAP) disposed of the petition. Grievances Committee of UAP denied pension benefits of Prof Qureshi. The COC Judgement contradicts Judgement of the Supreme Court of Pakistan dated 21,02.2013 in Civil Appeal No.48 of 2013, circulated by the Government of Pakistan, Finance Division, via letter No.F.11(1)-Reg.6/2013 dated 3.5.2013 directing to finalize the pension cases in no more than two weeks without fail. In case of any delay in finalization of the pension benifit cases and the matter is brought into the notice of this Court, the head of the concerned department shall be held liable for the contempt of court and shall be dealt with strictly in accordance with law.

**2023**

- Pakistani, Egyptian academia join hands to establish 'Dairy Science Park Cairo'

***Phase-V. Eco-Security & Global Integration***

- Prof. Subhan Qureshi, President DSP became a supporter of Haikou Initiative.
- Mr. Tian Dexin, Dr. Xie Yan had the first online meeting with Prof M Subhan Qureshi and Dr. Sher Bahadar Khan to discuss working in Pakistan.
- NESS Pakistan: https://dairysciencepark.org/ness/ became available and the Preparatory Committee NESS-Pak was established.
- Prof. Subhan Qureshi attended the 2023 NESS Congress online and delivered the presentation of "Our responsibility to protect the future of our kids on the Planet Earth".
- Prof M Subhan Qureshi prepared the Pakistan Initiative.
- Mr. Tian Dexin, Dr. Xie Yan attended the IRAD AWKUM Conference online.
- A call was made for registration of Supporters for NESS via Google Form.
- Recommendations were made for promoting ecosecurity in the region.

**2024**

- Attended NESS Eco-Security Congress along with Prof Sher Bahadar Khan.
- Pakistan Ecotourism Profile 2024 was prepared and shared with Dr Yan, IAPA for promoting tourism in the northern Pakistan especially for facilitating Chinese Tourists.
- International Solar Expo and Conference held at Peshawar
- Co-organized One Health II at AWKUM Mardan
- NESS Global Report 2024 – Pakistan Volume published

**2025**

- **Co-organized** One Health Conference III 2025 at AWKUM Mardan

# 9. ACHIEVEMENTS

## a. Biennial Series of International Conferences and Industrial Exhibitions

***i. DSP I – 2011 Peshawar***


The First International Conference and Industrial Exhibitions on Diary Science Park was held on November 21-23, 2011 at the Agricultural University Peshawar, with the theme, "Developing a hub of dairy enterprises in the flood affected regions of Khyber Pakhtunkhwa through partnership of academia, government, entrepreneurs & civil society". Cooperation was provided by the Extension and Research wings of the Livestock and Dairy Development, Pakistan Veterinary Medical Association and Livestock Trainers and Consultants as organizing partners.

HEC assisted as the main sponsor, followed by financial assistance from Alltech Pakistan Ltd, Ghazi Brothers, Karachi: Inter-cooperation (IC) Pakistan, Peshawar. ICI Pakistan and Naseem Traders/Romer Lab Rawalpindi also displayed their products through stalls.

Technical support was provided by ICRISAT India, SMEDA Peshawar, KPCCI, Charles Sturt University, NSW, Australia and Agri Livestock Bureau, Faisalabad. Website coverage was provided by AU Peshawar, Engormix.com, World Veterinary Year, 2011; World Vet Association; Int Soc Zool Sci; IBKRC Philippines; The Dairy Site News; Khyber Pakhtunkhwa Official Gateway News and Events. pakissan.com. Press coverage was provided by Daily Mashriq, Daily Aajj; Daily Pakistan Observer; The Frontier Post; Business Recorder; Associated Press of Pakistan; The Weekly Technology Times, Pakistan.

The conference was attended by +450 delegates from all four provinces of the country and Azad Jammu and Kashmir belonging to a variety of segments of the society. During the three days of the workshop, experts from academia, research, extension and industry, policy makers and farmers community presented 35 papers and exchanged ideas to work out a comprehensive plan for the development of dairy industry of the province. The workshop was inaugurated by the Honorable Minister for Agriculture, Arbab Muhammad Ayub Jan and concluded by Haji Hidayatullah Khan, Minister for Livestock.

Ninety-one Abstracts and 13 titles were published in an abstract book, ISBN-978-969-422-001-7. Another volume of the book was published covering recommendations, daily proceedings and pictorials. Fifty selected papers were published as a special supplement of the Journal of Animals and Plants Sciences. A committee shaped up the

recommendations into various components including Business Support, Infrastructural Support, Legislative And Policy Support, Animal Production Support, Animal Health Support, Environment And Energy Solutions, Institutional Strengthening and Coordination.

*Recommendations*

Honorable Minister of Agriculture, Government of Khyber Pakhtunkhwa, Arbab Muhammad Ayub Jan mentioned during the inaugural session of the workshop that unemployment is one of the major issues of our province and can only be addressed effectively if we develop dairy sector as there is a huge potential for its growth in the near future and to generate employment opportunities. The Honorable Minister for Livestock Haji Hidayatullah Khan has expressed his enthusiasm for increasing the size of ADP in the province and considered the livestock sector as having numerous benefits as explained in the light of the Holy Qur'an.

Both the Honorable Ministers commended the inexorable efforts of the Vice Chancellor, Agricultural University Peshawar and the Dean, Faculty of Animal Husbandry and Veterinary sciences and stressed upon preparing and pursuing the recommendations of the workshop for welfare of the people. Before finalization of the draft recommendation, the Business Incubation Program of the HEC and the Policy Action Plan for Implementation of Khyber Pakhtunkhwa Comprehensive Development Strategy 2010 on Livestock Sector, prepared by a Think Tank on advice of the provincial government and hosted by the University, were reviewed.

The recommendations Committee comprised Prof M Subhan Qureshi, Dr Nazir Ahmad and Dr Asad Sultan. Recommendations were presented as follows:

A. *Business support*

1. The Higher Education Commission of Pakistan has introduced the Business Incubation which is a business support process that accelerates the successful development of startup and fledgling companies by providing entrepreneurs with an array of targeted resources and services. These services are usually developed or orchestrated by incubator management and offered both in the business incubator and through its framework of contacts. A business incubator's main goal is to produce successful firms that will leave the program financially viable and freestanding. These incubator graduates have the potential to create jobs, revitalize neighborhoods, commercialize new technologies, and strengthen local and national economies.

a. promote the commercial research culture through the strong venture of university-industry Tag.

b. boost the economic development by verge of Industrial Research output.

c. foster the formation and development of start-up businesses to the point of obtaining significant, third-party investment support.

d. educate startup companies/entrepreneurs about the process of new venture development to improve their potential for future entrepreneurial success. e.

create an entrepreneurial community to give students the experience of learning through mutual support, a process critical for successful entrepreneurship.

2. The Faculty of Animal Husbandry and Veterinary Science has worked in this direction through several programs. Broilers and quails production has been in practice for meeting the requirements of consumers at the Greater University Campus. Dairy Technology Center and Feed Mill have been run on sustainable basis for boosting the dairy enterprises in the accessible areas. The Dairy Herd Improvement Program of the Veterinary Clinics has linked private dairy farmers with the faculty.

3. The semi-commercial activities of the faculty will be pulled under Dairy Science Park at Agricultural University Peshawar, in line with the idea generated in Egypt during conversation between Prof M Subhan Qureshi, Chief Organizer IW-DSP, 2011 and Mr Abdur Rahman Ilyas, ICRISAT, India. The enterprises owned by the business partners will be affiliated with the park as model enterprises for technology application and further replication.

4. The private sector will be encouraged and attracted to invest in the livestock and dairy sector by providing them with a conducive environment and relief in policies. The government shall extend special benefits in terms of electricity charges, provision of barren land on lease basis and taxation etc, to all types of relevant enterprises.

5. Financing partners will be provided for the program through local institutions. International investment will be explored through foreign missions, especially the Middle East, Malaysia, Turkey, Iran and other friendly countries. The Khyber Pakhtunkhwa Chambers of Commerce and Industries will look for partnership with similar bodies in the rest of Pakistan and friendly countries.

6. Creating an information system for all sorts of livestock activities to update farmers about markets, institutions and other facilities available to them.

*B. Infrastructural support*

1. Establishment of salvage farms for rearing and caring of dry animal and to prevent them from slaughtering to maintain the genetic pool of best breeds of livestock population

2. Establishment of model dairy farms for extension, research and business demonstration purposes at regional level under partnership with the private sector 3. Establishment of modern slaughter houses with advance facilities to ensure the production of quality meat to the consumers and to be used for research purposes targeted at meat industry expansion and provision of HALAL MEAT to the entire Muslim community. The first model will be established at Agricultural University, Peshawar.

*C. Legislative and policy support*

1. Reviving the existing livestock policy and making a new policy compatible with local environment. Regulating the livestock production system for incorporating environmental, economic and public health concerns. Revising pricing policy for livestock and dairy products in accordance with input and output expenses in the business

2. Quality control systems shall be introduced and standards shall be defined for milk, meat and by-products to certify for entry into local and international markets. Quality control shall be introduced in milk and meat marketing.

3. New legislation shall be made to overcome problems associated with exporting livestock and dairy products

4. Devising and strict implementation of policies to control the smuggling of livestock across borders to Afghanistan and other countries.

5. Periodic livestock census should be conducted to generate valid data and make the right decision accordingly.

6. Regulating the slaughtering of animals to prevent the losses of potential animals, especially under-age and pregnant animals and to address public health concerns by rejecting animals carrying zoonotic risks.

7. The current marketing system is outdated and needs to be re-structured and re-organized. This requires a detailed analysis of the present marketing system to make it producers' and consumers' friendly and attract new investments. The income coming out of the slaughter houses and cattle market shall be spent on the business support initiatives proposed under this draft.

*D. Animal production support*

1. Integration of the four pillars into development strategy, i.e. 1) Genetics 2) Nutrition 3) Management 4) Health.

2. Local breed improvement programs should be launched and collaborated with other provinces. A provincial nucleus of different breeds of dairy animals should be established to improve their production potential and to conserve them through advanced techniques. Achai conservation activities may be linked with research setup for meaningful data analysis and strategy development.

3. Camels have extraordinary potential to produce milk. This milk has been narrated as a panacea for different human diseases in Hadith. This miraculous milk should be investigated in modern scientific ways to be used as a good source of income and medicine.

4. Azikhili Buffaloes, a well known breed of the province has got wonderful features and milk producing potentials. It is warranted to deeply investigate their genetic make-up to fully exploit its milk production potentials and adoptability to the local climate.

5. Farmers must be educated to raise dairy goats (beetal) and sheep (damani) who are unable to raise cows and buffaloes due their rearing cost.

6. Nutritional status of livestock in the province should be improved by promoting high yielding and nutritive fodders and improving pasture conditions for grazing livestock.

7. Establishment of silos (for silage making) at commercial level to ensure the availability of feed for livestock throughout the year at affordable prices for both commercial and non-commercial farmers

8. Research work is needed to examine non-conventional feed resources in dairy animals to control and reduce high feed costs and to generate more income.

*E. Animal health support*

1. Developing and testing locally produced medicines and vaccines to reduce health related costs and to create new employment opportunities.

2. The potential benefits of herbs in veterinary medicine shall be exploited on a modern scientific basis to ensure safe end products for consumers.

3. Vaccine production shall be supported for qualitative and quantitative improvement against foot and against locally prevalent diseases and considered for export through incorporation of international standards.

4. Modern biotechnological techniques shall be used to minimize the reproduction and production losses in the dairy industry.

5. Efforts shall be made to investigate and minimize all sorts of stresses, especially heat stress to improve reproduction in dairy animals. Different approaches must be undertaken (nutritional and environmental) to cope with high heat stress during summer temperatures and production stress in the genetically improved animals.

6. Alternative and easy methods/tests shall be developed for minimizing losses in productivity and fertility e.g. newly emerging methods of early pregnancy.

*F. Environment and energy solutions*

1. Environment related issues should also be focused before launching any big dairy project to keep our environment safe.

2. Renewable energy solutions may be introduced for safety of the environment and self-sufficiency in energy production.

*G. Institutional strengthening and Coordination*

1. Various institutions in the public and private sectors are working to support livestock related activities, however the coordination is not very effective. The major stakeholders namely academia, research, extension, civil society and industry must join hands for collaborating their activities and sharing information and resources for achieving the common goal of supporting the livestock sector to play its due role in food security and income generation. A working committee may be assigned this task.

2. An interactive forum for discussing the major issues to develop, update and implement a comprehensive policy for the development of the industry, is required. It may be mandated for frequent exchange and dissemination of information among

different segments of the livestock sector through successful organization of workshops, conferences and seminars.

3. Researchers and institutions need to be facilitated and strengthened to promote quality research and resolve problems of the dairy sector. International standards shall be incorporated in the research system. Career development of the scientists for better delivery of services is required.

4. Creating new and re-organizing the existing extension system to provide facilities to farmers at their door steps. Extensive involvement of the extension officers in the development process.

5. Training of livestock workers, researchers and other scientists to cope with the new challenges of the modern livestock and dairy sector. Short training courses for livestock farmers and school and college students (during summer vacations) in the rural areas.

6. Establishment of ISO standard laboratories to assess the quality of feed, water, drugs and other inputs for consumption by livestock and analysis of livestock products for fitness for human consumption. Devising farm tests to check feed and water quality.

7. The ITAC Cell at the KPCCI will be assigned the task of livestock business support and linkages with the University, Livestock and Dairy Development Departments, (Extension and Research) and SMEDA. Effective linkage of the cell with other CCIs and financing agencies.

8. Incorporating the internship concept into the work plans of all relevant organizations for career development of the outgoing graduates and producing quality manpower for boosting the national economy through jobs finding in the local industry and abroad.

***Ii. DSP II – 2013 Peshawar***

The Second International Conference and Industrial Exhibition on Dairy Science Park was organized in 2013, Nov 18-20, focusing on developing the enterprising capacity of livestock and poultry farmers of Pak-Afghan Region for meat production. The Conference was attended by 500+ members. The Higher Education Commission was the main sponsor supplemented by other sister and development agencies and private companies. Papers were presented during 9 sessions by speakers from various parts of the country, 6 faculty members from Kabul and Nangarhar University Afghanistan and Dr Mithat Direk from Selcuk University, Turkey.

Two hundred abstracts were published in the proceeding book with the ISSN

number. A recommendation committee has compiled their findings and are being shared for implementation by various relevant stakeholders, mainly focused on business incubation and development of the required infrastructure and services. A roadmap for implementation of the Park as a Business Incubation Center is under consideration by the HEC for sponsorship.

*Recommendations*

1. The Standing Committee on Livestock at the Khyber Pakhtunkhwa Chamber of Commerce and Industries will analyze the strengths and weaknesses in the production and marketing lines and work on strategies to provide immediate and long term solutions.

2. Utilizing the Working Group on Livestock and Poultry Business at the Small and Medium Enterprises Development Authority for modulating and supporting the SMEs in the private sector through involvement of graduates and their integration with service providers and marketing actors.

3. Qualified graduates with aptitude, commitment and required skills shall be encouraged and supported to initiate their own entrepreneurship in livestock and poultry production, processing and marketing under various schemes like Prime Minister Youth Support Program.

4. New investment opportunities in the livestock sector need to be highlighted through workshops and seminars in consultation with stakeholders, in partnership with the Khyber Pakhtunkhwa Chamber of Commerce and Industries, the provincial government and the University.

5. All types of animal trafficking needs to be covered under regulation and documentation within the province and along the national and international borders, provided with appropriate technical and legal support.

6. Supporting the present production lines in livestock and poultry with abattoirs, meat processing, storage and transportation faculties at various sites; starting with a demo model at the University.

7. Demonstrating potential commercial activities like silage, hay making and special fodders in certain areas and their availability in feed scarcity areas during certain seasons.

8. Replication of quails, broilers and turkey farming as entrepreneurship models developed at the University of Agriculture Peshawar, for replication elsewhere and integration with marketing networks.

9. Linkages with the national and international Industry may be strengthened by involving the graduate internees in the livestock production, value addition and marketing system and the business/civil society organizations in extension, teaching and research.

10. Diploma courses for graduates and short term training courses for skilled

workers are recommended in livestock entrepreneurship focused at establishing a network of production, processing and marketing lines.

11. The quality control program available at the Universities and research organization may be strengthened to accredit livestock and poultry products for international markets. Applied doctoral research will be conducted to evaluate and certify the inputs and products.

12. Conducting regular surveys to monitor the trends in livestock production and marketing for identify technical and marketing needs of the sector for further intervention.

13. Revisiting the courses for graduate and postgraduate veterinary syllabi and tailoring them with ground realities in the livestock sector.

*Farmers' Perceptions*

1. A draft report was prepared by Mr Azam Shah Dairy/Sheep Farmer/Ex-member Federal Livestock Board and presented in his inaugural paper during the Livestock Development and Business Session of the Dairy Science Park 2013. The same is hereby reproduced by the Chief Organizer, Prof M Subhan Qureshi as follows.

2. Pakistan's livestock sector could not succeed in utilizing its economic potential up to an optimum level due to no integration of facts into the national development agenda like contribution of the sector to GDP up to an extent of 12%, 55% being within the Agriculture Sector. Khyber Pakhtunkhwa being a hilly, arid or mountainous terrain, is suitable for meat production, rather than dairy, however, it could not be integrated into the policy. Livestock assets in the country exceed Rs.1000 billion.

3. Although the sector is ignored at policy level, it still showed an appropriate growth rate of 3.5%, mainly achieved on the basis of interest of the farming and business community at informal level.

4. Majority of livestock holdings belong to low social economic class, falling below poverty line; possessing livestock heads but not the required land. They can be easily shifted to a status of entrepreneurship through research, development and marketing support, alleviating their poverty and producing surpluses for the export sector.

5. The livestock farmers are living under a primitive system, with the worst type of practices. Integration of scientific practices and marketing backup will increase their income several fold, leaving a visible impact on the national economy.

6. A hostile pricing system is preventing growth and development of this sector. The controlled prices of products and uncontrolled prices of farm inputs make the business vulnerable, leading it to total collapse under certain circumstances. The local government authorities must understand that the price of a buffalo during 1990 was Rs.1,000 and milk price was Rs.10. Presently the two figures have reached to Rs.150,000 and Rs.75. Proportionately the current milk price must not be less than Rs.150, if the government wishes to regulate it; otherwise it must be left free as for inputs. Legislation is needed for supporting the existing farming system and attracting new investment.

7. The trickledown effect of the research and development project up to the grass root level is totally lacking, which needs consideration at policy level. The research is conducted under the best possible environment, which does not reflect the real issues prevailing under farmers' conditions.

8. At the time of independence the number of industries was limited; however, the industrialization of the textile sector has enabled it to contribute a significant share to the export sector. Huge loans were granted in the name of the livestock industry; however these led to defaults which are frequently reported in the print and electronic media.

9. If the present government allows the poor people to get resources for developing their livestock holdings into viable entrepreneurs, and develop new ones, it would leave a good impact on the future of the province and performance of the present government.

10. Such steps would raise the people of poverty and bring social, economic and political stability in this vulnerable province.

11. The people of the province have always welcomed change. An effort of the Federal Livestock and Dairy Development Board was successful in establishing fattening farms and about 5000 viable units were established. However, the government did not fulfill their commitment and amount of Rs.6.4 million due to be paid to the farmers was refused. It led to breaking of the Units and herds of the farmers. As a member of the Board I was disappointed and pulled away from it; however, on request of Prof M Subhan Qureshi I have come back again to share my feelings with you.

12. An international Halal meat market is dealing with a trade of US$ 635; does our province involved in meat production does not deserve to get its due share of 10%? Halal Industry Park has been established at Faisalabad; and no body at top level in the province is noticing the Dairy Science Park established here in this province.

13. A Muslim consumer in any part of the world would be pleased to get Halal meat with Peshawar label; and a farmer in KP would get due return for his/her investment in such a case. We can easily make this dream true through joint efforts. The roadmap of the Dairy Science Park focusing on graduates' entrepreneurship to be supported by the University, the government and the Chamber of Commerce and Industry seems to be a feasible step to harvest the future.

*Animal Health Coverage*

1. Prof. Dr. Khushi Muhammad, Chairman, Department of Microbiology, University of Veterinary and Animal Sciences, Lahore was kind enough to provide recommendations for this section, reproduced as follows.

2. There are various types of infectious diseases that are highly detrimental for the dairy industry. For many years, dairy animals have been imported without proper planning and ignoring the L&DD Pakistan policy that has resulted in occurrence of many diseases causing heavy economic loss to newly developed dairy farms. The infectious

problems are Foot and Mouth Disease, Hemorrhagic Septicemia, Hemoparasites, brucellosis, Congo virus, etc. On account of these diseases, some of the farmers are out of dairy farm business.

3. Foot and mouth disease (FMD) causes high morbidity (50-80%) in dairy animals and high mortality (50-80%) only in young claves in addition to reduced milk production, weight gain, working efficiency, skins/hides quality, and abortions, mortality in young calves, treatment cost and trade embargo. In this way, total loss only due to the FMD is more than Rs 4 billion/ annum. Currently, Veterinary Research Institutes (VRIs) at Lahore, Punjab and Peshawar, KPK, and UVAS, Lahore are producing approximately 2 million doses of FMD vaccine. Infrastructure (Flow) of the 13 above mentioned institutes is more suitable for research purposes rather than vaccine production.

4. There are many diseases against which vaccines are not being produced in the country. Government is therefore required to make necessary arrangements to provide funds to researchers in research or teaching institutes for isolation and molecular characterization of locally prevailing pathogens, evaluation of their immunogenicity (HACCP, BMR, SOP, etc), and training of technical man-power for production and evaluation of the vaccines. The government may encourage the private sector for the development of biologics production units and vaccine production for commercial purposes.

5. The private biologics production units may be directed to get their units accredited from Pakistan National Accreditation Council (PNAC) and Ministry of Health. The accreditation must be essential for production of vaccines according to international standards.

6. In UVAS, it has been observed that the total cost for one dose of FMD containing immunogen against "O", "A" and "Asia-1" serotypes of FMD virus and Pasteurella multocida (cause of HS) is not more than Rs 30. The cost includes technical cost, depreciation cost of building and equipment, marketing cost. The market price of local markets is rupees 50 while the cost of one dose of imported FMD vaccine of the same quality is more than Rs 150. Vaccine production is highly profitable entrepreneurship so the private sector may come forward to support livestock production. Local vaccines shall be prepared using locally prevailing pathogens so shall be more effective to control the diseases.

7. The efficiency of the available diagnostic laboratories may be strengthened and accredited for diagnosing every infectious disease through advances, reliable, quicker and cheaper technologies. A strong and effective coordination with the sister labs, national and international organizations may be ensured.

*Ministers Directive and Implementation*

In pursuance to the directive of the worthy Minister for Agriculture and Information Technology during his visit to the University, a meeting of the Mr Ahmad Said, Chief Planning Officer, Dr Sher Muhammad Director General Livestock and Dairy Development and Prof M Subhan Qureshi Dean FAHVS, the University of Agriculture Peshawar was held on 26-10-2013 to discuss implementation strategy for the directive. The participants agreed on:

1. Introducing the business setup by the University graduates in broilers, quails, turkeys and ruminants farming, etc., and seeking the SMEDA support in developing the business further utilizing the latest techniques.

2. Inviting the KPCCI representatives to consider such enterprises for further investment, especially in establishing slaughtering facilities.

3. Launching research at the University on commercial aspects of meat production and quality control, making the production system competitive at the international markets.

4. Establishing a mini-slaughter house at the University for graduate teaching and launching of postgraduate diploma courses livestock entrepreneurship.

5. Utilizing the resources, skills and knowledge available at the University and the L&DD Department for developing the private sector, enabling expansion and introducing quality control in the production and marketing chain.

6. Supporting the outgoing University graduates during their six-months mandatory internship as prescribed under the Pakistan Veterinary Medical Council Act 1996 through a joint project of the University and the L&DD Department.

7. Providing an enabling environment for establishing a private company by the Department and slaughter houses in the private sector.

8. Utilizing information technology in linking the enterprises effectively with the Department, the University, services/inputs providers and the International Halal meat market.

9. Holding 2nd International Workshop on Dairy Science Park, November 18-20, 2013, at the University in which the public and private sector and the Universities would be participating.

***Iii. DSP III – 2015 Peshawar***

The Third International Conference and Industrial Exhibition on Dairy Science Park was organized on Nov 16-18, 2015, focusing on support to the war-hit economy of Khyber Pakhtunkhwa through self-employment and hygienic food production for local consumers and international Halal Meat Market. The Senior Minister Mr. Inayatullah Khan inaugurated the Workshop, participated by academic, government and industry leaders, policy makers and farmers,

from all four provinces of the country, Azad Jammu and Kashmir, Afghanistan and Turkey. Mr Mohibullah Khan Special Assistant to Chief Minister on Livestock, Mr Arif Yousaf Special Assistant to Chief Minister on Law and Mr Jaffar Shah Member Public Accounts Committee and Arbab Asim Khan District Mayor Peshawar chaired various sessions, accompanied by Deans and institutional heads from various organizations.

Seven technical sessions were held comprising: i) Livestock Development and Business Incubation; ii) One Health; iii) Feed and Food Safety; iv) Animal Health and Technology; v) Poultry Science and; vi) Prospective Dairy Farming and Dairy Products in Pakistan. MoU's were signed by the Dairy Science Park team with the Mevlana Exchange Program and Selcuk University Turkey.

The Senior Minister Mr. Inayatullah Khan inaugurated the Third Workshop flanked by Prof Zahoor Ahmad Swati, Vice Chancellor of the University of Agriculture Peshawar and Prof M Subhan Qureshi, Dean FAHVS/Chief Patron DSP. Academic, government and industry leaders, policy makers and farmers, from all four provinces of the country, Azad Jammu and Kashmir, Afghanistan and Turkey, participated in the event.

The Senior Minister and Vice Chancellor expressed their appreciation that renowned scientists from within the country and abroad attended the event, focusing on a burning issue of self-employment and hygienic food production in the region. Prof. M. Subhan Qureshi welcomed all the delegates and thanked them for sparing their valuable time to attend the event. The Dean also thanked the organizers and then presented a brief overview of the DSP.

Prof Qureshi explained the aim of the third conference and mentioned that it is the right time to start business incubation on the basis of the ideas that are generated in the research Institutions in-order to support the industry and create self-employment. In this regard the production of hygienic meat and milk can play a key role.

The DSP has established collaboration with Sandia National Laboratories to reduce risk to human health from the animal industry. Moreover, collaboration has been established with China Academy of Science to promote collaborative research for industrial support and exchange of scholars under the China Pakistan Economic Corridor (CPEC).

Prof. Qureshi proposed a business incubation center costing a sum of 250 million for infrastructure in addition to Rs.250 million as an Endowment Fund. He recommended development of quality control standards at farms, clinics, processing and market places. Endowment funds would be utilized for developing/replicating feasibility models and revitalizing the underutilized assets in public and private sectors. The Endowment Fund will support industrial research projects under the Business Incubation Center.

The Vice Chancellor applauded the presence of so many eminent scientists from Pakistan and other brotherly countries which guarantees that many useful ideas will be generated and the gap between academia, industry and producers will be bridged up. The worthy Vice Chancellor UAP welcomed and thanked the delegates,

especially those coming from Turkey and Afghanistan. He expected that the technical sessions would come up with new ideas for the uplift of the livestock industry.

He thanked the organizers for successfully arranging such a mega event which has honored the University of Agriculture Peshawar in a big way. The worthy VC also stressed that we have wasted 68 years, and despite the fact that our homeland has one of the world's best natural resources including those of agriculture land and livestock species, we failed to exploit those resources for the betterment of our people. He concluded his speech with the hope that the government will make policies that could enable us to utilize our agricultural resources optimally.

Mr Inayatullah Khan, the Senior Minister/Minister Local Government, Elections and Rural Development endorsed the comments of the worthy VC and Dean that our natural resource could not be utilized so for the uplift of the people, and further said that the province of KP has the potential for generating 30,000 MW of hydal power; 600 million barrels of crude oil; 10 trillion cubic feet of natural gas; and millions of acre of barren land in the Southern districts. In addition, the province can generate a lot of revenue from tourism.

The Senior Minister shared his concern over the failure to exploit the resource base. However, we do not need to spread disappointment and fear in the youth, rather we need to work hard and devise policy for utilization of resources by bridging the gap between the policy maker, academia and industry. The Senior Minister declared the Dairy Science Park as the bridge to fill up the gap. The Senior Minister informed the participants that his ministry has allocated a sum of 200 million for the establishment of a model slaughter house. He endorsed the idea of establishment of an autonomous DSP Board which will be run by eminent scientists, industrialists and farmers' representatives and the board will work as an independent organization.

In his concluding remarks the Senior Minister praised Prof M S Qureshi for his great vision for development of livestock sector and advised for a follow up meeting the establishment of DSP Board, Dairy Science Park Act and streamlining the slaughter house project within two weeks time. The District Nazim (Mayor), Arbab Asim Khan chaired the second technical session on the second day of the three day workshop. He appreciated the theme of the workshop covering self-employment and hygienic food production in the region and desired cooperation under the Park for entrepreneurship of youth especially the youth in quails farming.

He advised the Dairy Science Park organization to develop standard operating procedures for livestock farming, products processing and marketing for application in the field. He desired training of butchers in hygienic meat production and marketing. He also desired training of local government elected representatives to exploit the indigenous resources in an efficient way.

Mr Mohibullah Khan, Special Assistant to the Chief Minister on Livestock advised for preparation of a livestock policy for the province. He chaired the concluding session of the Workshop along with Mr Arif Yousaf Special Assistant to Chief Minister on Law and Mr Jaffar Shah Member Public Accounts Committee. Mr Arif Yousaf highlighted the importance of sustainable development goals (SDGs) and was pleased to know about the selection of the Dairy Science Park by the United

Nations as a partner for SDGs. He was interested in the Dairy Science Park Act KP and asked the organizers to come up with the draft act for further processing to provide relief to the partners of the Dairy Science Park, creating an enabling environment for investment in the province.

Seven technical sessions were held comprising: i) Livestock Development and Business Incubation; ii) One Health; iii) Feed and Food Safety; iv) Animal Health and Technology; v) Poultry Science and; vi) Prospective Dairy Farming and Dairy Products in Pakistan. The Sessions were chaired by Prof M Sarwar, Prof Zafar Iqbal, Prof Ahrar Khan and Prof Anas Sarwar from UA Faisalabad, Prof Ashraf from UVAS Lahore, Prof Younas Rana from CVS Jhang, Dr Arfan from PMAS Arid University Rawalpindi, Dr Iqbal Khattak from VRI, Prof M Afzal AUP, and Dr Mithat from Turkey. Delegates from ILRI, L&DD, COMSATS, SMEDA, AJKU, Romer Labs, KMU and AWKUM participated. HEC was represented by Mr Nasir Shah, Director QAA.

As suggested by Dr Mithat Direk, the biannual International Workshops on Dairy Science Park, will be jointly organized in continuation with those held during 2011, 2013, and 2015. The suggested venue for the 2017 conference is Istanbul, Turkey.

*Recommendations*

1. The Senior Minister urged upon efficient utilization of the natural resources available in the Khyber Pakhtunkhwa province for the welfare of the people. The gap between the policy makers, academia and industry was highlighted. The Dairy Science Park (DSP) was declared as a platform to bridge up this gap. The Senior Minister advised that the amount of Rs 200 million released by the Local Government, Election and Rural Development Department KP for the establishment of the Slaughter house at Peshawar may be utilized in appropriate consultation with the DSP experts.

2. The Senior Minister advised that an autonomous DSP board may be established under the supervision of eminent academicians, and representatives of the Government, industry, farmers and civil society, focused on the burning issues of self-employment and hygienic food production. The Board will provide an infrastructure for Business Incubation Centre (Rs.250 million) to promote industrial research under an Endowment Fund (Rs.250 million). This is in line with the HEC vision of "facilitating higher educational institutions to develop entrepreneurship capacities and mindsets of youth". A follow- up meeting will be held to process the case.

3. The Special Assistant to the Chief Minister (Law) Khyber Pakhtunkhwa appreciated selection of the DS Park for partnership by the United Nations under Sustainable Development Goals for self-employment of the youth and hygienic food production for the people of Khyber Pakhtunkhwa and FATA. He informed that he is chairing the committee on SDGs in the province and would include DSP in the onward consultation process.

4. DS Park signed a memorandum of understanding with Selçuk University, Konya, Turkey and another with Mevlana Exchange Program, Turkey. The Turkish side was represented by Dr Mithat Direk and Pakistan was represented by Mr Arif Yousaf, Special Assistant to the Chief Minister Khyber Pakhtunkhwa and Prof Dr M Subhan Qureshi, Dean FAHVS, UA Peshawar. The former MoU will facilitate exchange of staff and

students of Pakistani and Turkish Universities and the latter will facilitate collaborative research and industrialization processes in collaboration with Konya Teknokent (Selçuk University, Technopark).

5. MoUs were signed by the Vice Chancellor, The University of Agriculture Peshawar for academic linkages, with the two Turkish organizations.

6. The aim of the third international conference was to formalize the business incubation process and the participating experts would be consulted to move forward in this direction.

7. The District Mayor Peshawar advised for initiating an MoU with the DS Park to establish youth entrepreneurship, develop quality standards for livestock farms, processing and marketing channels and train the elected representatives in utilizing natural resources for employment generation and food production. The Mayor appreciated the efforts of the University in developing business models like quail production and helping the meat processing and marketing partners in adopting hygienic standards. He advised for developing quality standards and training of commercial farmers, butchers and industry workers to protect the environment and ensure access of the people to hygienic meat, eggs and milk. It will help in development of entrepreneurship for the youth and preparation of the region for Halal food local consumption and export. Research finding of FAHVS and elsewhere, would be utilized for this purpose.

8. The collaboration initiated by DS Park with the Sandia National Laboratory USA, Chinese Academy of Agricultural Sciences, CEBG of Pakistan Army and nine countries through Focal Points was appreciated. These linkages will be utilized for achieving objectives of the DS Park.

9. Livestock Advisor appreciated the efforts of the organizers in conducting such an auspicious conference to discuss the issues of the Livestock Sector. He urged upon an enhanced collaboration among the Directorates General Livestock and Dairy Development Department (Extension and Research Wings), the Faculty of Animal Husbandry and Veterinary Sciences, UA Peshawar and the farming/business community. He urged on development of a livestock policy to respond to the prevailing issues.

10. Dr Mithat Direk offered his support to organize the Fourth International Workshop on Dairy Science Park at Istanbul during November 2017 which was welcomed by the participants with thanks.


***iv. DSP IV – 2017 Konya, Turkey***

The 4th International Conference and Industrial Exhibition on Dairy Science Park was held on November 1st to 5th,

2017 at Selçuk University- Konya, Turkey. The Conference was organized jointly by the Mayor Konya Municipality, Konya Turkey, Selcuk University Konya, Konya Teknokent, Dairy Science Park Society Peshawar, Women University Mardan, University of Agriculture Peshawar, Baluchistan University Quetta and Government of Khyber Pakhtunkhwa, Pakistan. Prof M Subhan organized the Conference as Chief Patron DSP and Dr Mithat Direk assisted as Turkish counterpart.

The event was a continuation of the series held during November 2011, 2013 and 2015 at Peshawar, Pakistan. The three conferences focused on rehabilitation of the post-flood Dairy Sector; Halal meat export potential of the Region and entrepreneurship-based hygienic food production respectively. The fourth event of the series was held with the theme "Achieving Food Security through Entrepreneurship Development and Biorisk Management (BRM)".

Khyber Pakhtunkhwa, Special Assistant to Chief Minister, Arif Yousaf said, "The scientists in Pakistan and Turkey will work together to organize such conferences and high level consultation for establishment of technology centers in the future. He was addressing the Fourth International Conference and Industrial Exhibition on Dairy Science Park in Konya, Turkey. I would like to thank especially Konya Metropolitan Municipality and Selçuk University for organizing the conference. The conference has attracted participation from 20 countries, including Turkey, Pakistan, Australia, China, Iraq, Egypt, Algeria, Mongolia, Nigeria, Sudan, Bosnia, Gambia, etc. Mr Arif Yousaf assured support of the Government of Pakistan to support TechnoPark Mardan and TechnoPark Quetta, for generating entrepreneurship and bringing quality standards in the food value chain in the two provinces.

Süleyman Demirel Cultural Center hosted the opening session of the conference. Dr. Mustafa Şahin, Rector Selcuk University stated that the universities are very important institutions for the development of the countries and the universities are places where the future of the countries is planned and younger generations are trained to build the countries. Recognizing the support of the Mayor Konya Metropolitan Municipality for organizing the event, Dr. Sahin, referred to the conference theme as entrepreneurship in the food value chain, to be shared by participants from different areas, with diversified ideas and experiences which must be appreciated. Each country has its own experience and the recommendations may be very useful.

"Konya is the source of agriculture in Turkey", Mr. Abdülmelik Ötegen, Deputy Mayor Konya Metropolitan Municipality, emphasized on the significance of such a meeting being held in Konya, saying that the future of humanity is directly related to agriculture and that the source of agriculture in Turkey is Konya in a sense. Ötegen mentioned the achievements made in agriculture by Metropolitan Municipality, "I believe that we will get positive results in the direction of the participants' declarations. We desire all these efforts to produce healthy results.

Because all these reports and meetings highlighting problems such as agriculture and food safety and the inadequacy of food insufficiency are very important for our country and for the future of the world, High level officials of various Turkish organizations attended the inaugural session, including Ihsan

Bostanci, Chairman of Regional Development Administration of Konya Project (KOP), Fatih Özdemir, Director of Bahri Dağdaş International Agricultural Research Institute, academicians and other agricultural stakeholders participated.

"We will try to benefit from the wisdom and experience of Turkey" Chief Patron Dairy Science Park, Prof. Dr. Subhan Qureshi mentioned the leadership role of Turkey among all Muslim countries and recommended that Pakistan must try to utilize Turkey's wisdom and experience. He started his presentation with Darood Sharif accompanied by all participants. He appreciated the achievements made under Technoparks in Turkey for transformation of academic research for industrial utilization. He suggested establishment of Technoparks in Mardan and Quetta with technical assistance of Turkish teknokents for utilization of indigenous resources of the provinces of KP and Balochistan for peoples' welfare. He acknowledged support of Sandia National Labs USA, HEC, PSF, PARB and other organizations for sponsoring the delegates, staff and faculty members and Konya Municipality Corporation for the excellent arrangements.

Pakistani delegates exceeded 50 in number, comprising Prof Ghazala Yasmeen Vice Chancellor, Women's University Mardan; Dr Azam Kakar, Director World Bank Quetta; Dr Johar Ali Member Animal Sciences PARC, Mr Niamatullah Jan and his colleagues from BRSP, Mr Shakoor SMEDA, Dr Naeem Shahwani BUITMS Quetta, Prof Nazir Ahmad, Prof Umer Sadiq and their team from UAP; Dr Tayyab and Dr Niaz Ali KMU Peshawar; Dr Zahid ISRA University Islamabad, Dr Maqbool Dogar and his colleagues form UA Faisalabad, delegates from UVAS Lahore, Poonch University AJK, IUB, NUST Islamabad and UET Peshawar.

The inaugural session was followed by the first technical session covering Livestock Production with eight oral presentations. Papers were presented on the use of biotechnology for food security, red meat production in Mongolia, thermal and nutritional stress, neonatal development, semen quality, milk production and meat technology.

On the second day parallel sessions were held in two halls. Hall A covered session on One Health. Papers were presented on One Health achievements and future vision under Dairy Science Park, antibacterial property of Bacillus, Dairy Sector in Yemen, hypoglycemic effects of Quinolone, dietary interaction and use of plant extracts with dental health and environment-farming interaction. Food Security and Ethics was run in Hall B, covering Food Security and Ethics. Papers were presented on meat production, role of cooperative farming, fodder production, enzyme technology, extension tools and awareness about food security. Session on Meat and Dairy Entrepreneurship was held in Hall A, covering a review of BRSP, evaluation of livestock production in Celebiler village, milk production around Konya, meat protein, bedding for dairy cows and introduction of farm technologies. After coffee break papers were presented on workers safety applications, meat quality, milk production systems and dairy cattle in milk.

Hall B covered session Animal Health and Technology and papers were presented on therapeutic effects of herbal plants, pathogenomics of E coli, estrous synchronization protocols, anemia, meat emulsion systems and Aflatoxin B in dried meat. Trends in Dairy Technology was another session covering papers on beef

petties, cheese mapping, neonatal development, ozone technology, oxidative stress and food security. A session on Small and Medium Enterprises Development was held covering challenges and scope of SMEs in Balochistan, buffaloes entrepreneurship, entrepreneurship, biotechnology in entrepreneurship, monopolistic marketing competition, sunflower/sorghum silage and eggs production.

Hall C covered a session on Biorisk Management, covering lab biorisk management, government academia linkages, bovine brucellosis, drinking water quality and antibiotic bacterial resistance.

On the third day of the conference a session was held on Entrepreneurship Development, ,covering achievements and future vision of Dairy Science Park, meat technology, mercury – lactation relationship, millet, gamma irradiation of rice and Peshawar Meat.

Certificates were presented to delegates and authors. Dr Mithat Direk thanked the delegates for their participation in the Conference and invited them to visit Konnya Teknokent and City Center, comprising Mevlana Mazar, Museum, Selle City. Prof M Subhan Qureshi thanked all the delegates and their sponsors for participation in the conference and presenting papers. He informed the delegates the next program will, hopefully, be held during November 2019 in China, Sudan, Egypt, Turkey or Pakistan, in consultation with the DSP executive team.

***v. DSP V – 2019 Quetta***

The Fifth International Conference and Industrial Exhibition on Dairy Science Park was held at Expo Center, University of Balochistan, Quetta on 19-21 Nov, 2019 with the theme "Emerging Trends and Opportunities in the Livestock Sector of Balochistan". The event was held during the Livestock Expo Balochistan 2019 in collaboration with the Government of Balochistan and Food Agriculture Organization of the United Nations.

صدر مملکت ڈاکٹر عارف علوی بلوچستان کی پہلی لائیو اسٹاک ایکسپو 2019 کا افتتاح کررہے ہیں، گورنر بلوچستان امان اللہ خان یٹیمن زئی، وزیراعلیٰ بلوچستان جام کمال خان چیف سیکریٹری کیپٹن (ر) فضیل اصغر، کمانڈر سدرن کمانڈ لیفٹیننٹ جنرل وسیم اشرف صوبائی وزراء و دیگر بھی موجود ہیں 18-11-2019

The event was inaugurated by The president of Pakistan, Dr Arif Alivi, Balochistan Governor Amanullah Khan Yasinzai, Chief Minister Jam Kamal Khan, Commander Southern Command Lieutenant General Waseem Ashraf, Adviser to the Chief Minister on Livestock Mitha Khan Kakar, Special Assistant Mir Ijaz Sanjarani, Balochistan Chief Secretary Fazeel Asghar, UoB Vice Chancellor Dr Anwar Panizai and other officials were present on the occasion.

The President of Pakistan visited the stalls exhibited by private companies and development organizations at the expo. He addressed the delegates and highlighted that livestock is a comprehensive field that contributes to nutrition, poverty alleviation, rural development and overall economic growth. He said that there is a

huge potential of investment in Pakistan in various fields and that Balochistan is quite rich in resources including mining, coast, fishing and livestock, and added that Pakistan can export livestock after meeting its domestic needs. Furthermore, he said that the world is seeing Pakistan as a lucrative place to do business. He said that Pakistan is at the birth of a new era in respect of economic development. The president said that he met a number of heads of states and governments and executives during his recent visits to Japan and Baku and found them positive in their responses regarding business with Pakistan.

Captain Fazeel Asghar (Retd), Chief Secretary Balochistan shared his message that the Livestock Sector is not only a mainstay of our economy, but is also a way of life for many of our people and an essential part of our culture and tradition. Balochistan Livestock Expo – 2019 is being held with the keen participation of national and international stockholders, which says that if we use our resources well, we can create a prosperous livestock sector that can provide employment and good incomes to many of our people. He believes that this is possible and the Government of Balochistan is obliged to make this happen by allocating sufficient public development resources for uplifting of this sector and encouraging private sector investment.

He thanked all those from inside and outside Balochistan who have helped to organize this Balochistan Livestock Expo – 2019. The Expo is going to provide a platform where the private sector, farmers, NGOs, academics, government staff and national and international experts and investors can talk and demonstrate together about livestock related issues and the way forward. This is the first time that such a deep and comprehensive consultative process has been undertaken in the Livestock Sector, so, the quality of outputs will surely reflect the hard work. I am glad to express that the present provincial leadership is determined to achieve "Prosperity in Balochistan through Livestock Development". He congratulated the entire team of organizers of the event.

The Conference comprised an inaugural session, Academia-Industry Linkages and Policy Reforms and Support Packages. Research and review papers were presented on: AOH=Animal Health and One Health; APT= Animal Production and Technology; FRM= Fodder and Range Management; QCH= Quality Control and Halal Practices; BAH= Biotechnology and Animal Health; EDV= Entrepreneurship Development; PST= Poultry Sciences; FRMI= Farming Innovation.

The Conference Proceedings were compiled by: Editors: Muhammad Azam Kakar, Sania Subhan Qureshi, Tauseef Asmat, Zahid Mustafa, Mahboob Ali, Muhammad Masood, Tariq Kiani and Muhammad Subhan Qureshi. The abstracts were published (ISBN-978-969-422-001-7; website: http://dairysciencepark.org.pk/leb/).

*Livestock Policy Balochistan 2019*

Livestock Policy Balochistan 2019 was launched during the event. The Policy was drafted through a consultative process conducted by the Livestock and Dairy Development Department Balochistan in collaboration with FAO and other stakeholders from the public and private sectors throughout the country. It was recommended that Balochistan's livestock sector must undergo significant transformation if it is to capitalise on its comparative advantages, meet the needs of

the population, and take advantage of the market opportunities.

It will not be easy, but the potential is significant. Very simple investments already show the significant gains achievable with limited investment. For example:

- Livestock fattening for the Eid and other markets has increased householder income by several folds;
- Mechanical clipping of wool and associated cleaning and grading has dramatically increased returns by several folds and opened up the appreciation and demand for wool;
- Household poultry production for women has increased incomes for women by several folds through the sale of chicks, eggs and meat and significantly improved household nutrition and women's agency; and
- Improved para-vet services for disease and parasite management has reduced livestock mortality.

Conservative estimates show that the escalation of these and other interventions through the Balochistan Livestock Policy could improve livestock household income over the next 10 years and generate sufficient revenue for the provincial population and businesses. The scaleup of these and other livestock opportunities is further helped by the CPEC investment that has improved connectivity throughout the province. This allows improved delivery of inputs as well as increased access to currently important provincial and national markets, as well as the future potential for increased export to China and the Middle-East.

This Balochistan Livestock Policy 2020-2030 aims to establish the pathway for these changes and consolidate the contribution of all stakeholders to achieve the initiatives proposed. The policy is a sector wide document addressing the needs of all stakeholders be they farming or herder families, input suppliers, veterinary services, aggregators, processors, wholesalers, retailers, consumers or government. The government is an important player, but one of many, and its role needs to focus on facilitation, policy and the creation of an enabling environment for private sector investment and sector growth. Apart from animal health, the livestock sector has received little quality support from the public sector, however given the tremendous potential of this sector for growth and improving livelihoods, the Government plans to accord priority to it in the future.

The policy does not operate in isolation but links closely to and will help guide the direction of the Balochistan Comprehensive Growth Strategy 2020-2025. It also will help the Livestock and Dairy Development Department (Government of Balochistan) of Dairy and Livestock Development to refine its vision and mission to align its services with sector needs.

The Balochistan Livestock Policy 2020-2030 is complemented by a detailed implementation plan that outlines the specific roles expected of:

- Investors: Including the private sector, government and Balochistan's development partners;
- Institutions: Ensuring that provincial and national agencies/institutions (including academia) responsible for key areas of the policy work

together and integrate their scarce resources to meet its aims.

- Policy makers: Identifying where policy reform and change is needed to overcome current bottlenecks and build an enabling environment that ensures both economic growth and the wellbeing of the population.

*Strategic Intent*

Small ruminants, dairy cattle, and poultry are the three subsectors that comprise over 80% of Balochistan's livestock value and production and present the major growth opportunities for the Balochistan livestock sector. These three subsectors have the scale, reach and competitive advantage to deliver prosperity and wellbeing to the majority of Balochistan's men and women. Over the next ten years these three sub-sectors will be the focus of the Balochistan Livestock Policy 2020 - 2030.

### *vi. DSP VI – 2023 Bahawalpur*

وَمَا أَرْسَلْنَاكَ إِلَّا رَحْمَةً لِّلْعَالَمِينَ

(Wama Arsalnaka Illa Rahmatallilalameen; O' Muhammad! You have been sent as a blessing to the Worlds; Al Qur'an, 21:107)

The Sixth International Conference and Industrial Exhibition on Dairy Science Park (#DSP2023) was held at the Islamia University Bahawalpur (IUB) on March 20-21, 2023. The event was co-organised by the Dairy Science Park (DSP), SECure All Pakistan (SAP), Camel Association of Pakistan (CAP) and IUB. DSP2023 was the 6th in the series being held in Peshawar (DSP2011, DSP2013, DSP2015), Konya (DSP2017) and Quetta (DSP2019), with changing themes from Post-flood Rehabilitation, Meat Production, Entrepreneurship Development, Biorisk Management and Emerging Trends to the present theme of DSP2023, set as Parallel Social Enterprise for the Vulnerables.

Bahawalpur is located in South Punjab; a region where, on one side there are lush green areas through irrigation and on the other side is the Cholistan desert with a very hard life and meagre facilities for the inhabitants. Both these areas are very important in terms of livestock, especially camel rearing. This conference provided an opportunity to bring together the camel/livestock farmers, academia and industry on a single platform and facilitate fruitful collaboration and cooperation.

*The Inaugural Session*

DSP2023 was inaugurated by Prof Naveed Akhtar, Pro-Vice Chancellor IUB. Vice Chancellor IUB Engr. Prof. Dr. Athar Mahboob supported the event as Chief Patron.

Prof M Subhan Qureshi, Conference Chair; Mr Muhammad Anwar Kamal Saleem Hashmi, Co-Chair; Dean FVAS IUB, Prof Muhammad Khalid Mansoor Khalid, Secretary General; Prof Illahi Bakhsh Marghazani, Secretary Technical and Dr Muhamad Shahzad, Secretary Coordination, played their major roles in organising the event. Ijaz Mehood Gorsi, DG LDD South Punjab participated in the session in addition to delegates from various public and private sector organisations of the country and abroad.

The Chief Guest welcomed the delegates, especially Dr Mithat Direk from Selcuk University. Camel milk was appreciated as a curative agent for various public health disorders. The first camel was purchased by pharmacy faculty during 2013 followed by establishment of Camel House by FVAS, IUB. The VC has provided all the required facilities to the FVAS for growth of the faculty focused on improvement in animal production.

*The Technical Sessions*

The Vice Chancellor University of Agriculture, Dera Ismail Khan, Prof. Dr. Masroor Elahi Babar chaired the first first technical (keynote) session and presented his paper on "Power of Genomics for Camel Improvement". Dr Mithat Direk presented a paper on "Evaluation of the Dairy Industry in Türkiye". Prof M Subhan Qureshi and Dr M Saqib presented their papers on Good Governance and Q-Fever.

The Technical Session II (Business Support) Session was moderated by Mr MAKS Hashmi and chaired by Sardar Ahmed Mujtaba Khan Rind and participated by Dr Zafar Siddiqui ISRA University, Syed Irfan Shah Khagga Planet Earth Community, Dr Abdur Rahman PSA&E-Village, Mr M Ismail Tax Consultant and Prof M Subhan Qureshi. Issues faced by the private sector and importance of academia industry linkages were highlighted. Entrepreneurship Development initiatives were covered under Group Discussion.

Prof M Subhan Qureshi suggested establishment of Livestock Entrepreneurship Development Center (Details available at #LEDC) as a good governance model of academia-industry-government nexus for which a private partner Mr Ahmad Mujtaba Mujtaba Khan Rind has offered to provide land of about 125 acres as a joint venture. The Islamic Development Bank (IDB) has already shown consent to support the proposal. A grant of US$ 0.5 million (PKR 142 million) comprising 70% of Endowment Fund and the remaining a non-lapsable development grant would cover this initiative.

Dr Ali Raza Abbasi, Ex-Director General, Cholistan Development Authority, moderated discussion with the farmers from the deep desert of Cholistan. Relevant issues faced by the farmers were highlighted and analysed. Technical and Marketing support was recommended for the region to enhance farmers income leading to support to the national economy.

On Day 2, Technical Session III, chaired by Dr Mithat Direk, commenced with a video presentation by Dr Mortaza Bitaraf Sani from Iran on genetic evaluation of camels. Several emerging scientists from various universities presented their research

work along with recommendations for field application of their technologies.

Technical Session IV (Camel Farming and Pastoral Values) was coordinated by Dr Muhammad Shahzad. Christina Adams from USA presented a film on "Autism Spectrum Disorder (ASD) and Camel Milk", made by Mr Abdul Shahid, Government Veterinary College Bekaner, India. It was followed by her video lecture on "Global Perspective on Pastoralists' Value to Biodiversity and Human Health".

*The Industrial Exhibition*

DSP2023 was supported by various organisations. The Industrial Exhibition attracted various stalls related to the livestock and poultry industry that were of most interest for the farmers and veterinary professionals. Total Nutrition, Aptly Pharmaceuticals, Ghazi Brothers, Dasan Feeds, UM Enterprises, Cloud Agri Pakistan, Leaders College Bahawalpur, GreenWend Energy and Dairy Science Park.

*LEDC Bahawalpur proposed*

Prof M Subhan Qureshi suggested establishment of Livestock Entrepreneurship Development Center (LEDC Bahawalpur) during #DSP2023 Bahawalpur at IUB as a good governance model of academia-industry-government nexus where a private partner Mr Ahmad Mujtaba Mujtaba Khan Rind will provide land of about 125 acres as a joint venture. The Islamic Development Bank (IDB) would be approached for providing a grant of Rs.100 million (US$ 0.36 million) comprising 70% of Endowment Fund and the remaining a non-lapsable development grant.

LEDC would be established as a business support powerhouse at IUB with components of Herd Health Program, Animal Health and Production, Meat and Dairy Technology, Halal and Hygienic Certification, Halal Meat Factory, Mini Feed Mill and Entrepreneurship Development Models. The registered farmers would be provided technical, financial, marketing and regulatory support to reduce the production cost and improve product quality/traceability and reach local and international markets. IUB, CAP, SAP and DSP would manage LEDC through a joint management committee and the net profit would be utilised as:

- 34% would be reserved for the Gift Fund for payment to the extremely vulnerable populations.
- 28% for the private partner providing land, animals, clinic, factory, meat/milk shop and operational arrangements.
- 28% will be paid to the relevant faculty members, staff and students involved in HHP.
- 2.5% each will be paid to DSP, CAP, SAP and IUB.

Selcuk University, Konya, Turkey will provide technical support to LEDC. Two draft MoU's were shared with all concerned for further processing. The Secretary LDD agreed on considering the proposal for endorsement to the IDB after vetting it in light of the interest of the local community.

*The Concluding Session*

The Concluded Session was chaired by Mr. Nasir Jamal Hotiana, Secretary, Livestock and Dairy Development Department (LDD) South Punjab. He appreciated the efforts of the organising committee for making the conference a success story. He assured that the academia and farming community would be supported by the government through meaningful need-based projects. He distributed certificates and shields among the farmers and organisers of the conference. In his closing remarks, he assured his complete support to the camel farmers for establishment of social enterprise to improve the economy of the camel farmers.

*Visit to CUVAS, Fort Derawar, fields for joint ventures and Golden Camel Award*

Sardar Ahmad Mujtaba Khan Rind facilitated the conference organisers to visit Derawar Fort and his land holdings adjacent to the Fort within the limits of 20 km, which he has already offered for establishing facilities for academia-industry-government linkages.

On the way to the Fort, Cholistan University of Veterinary and Animal Sciences was visited. Dr Qudratullah facilitated the visit. The Departments of Clinical Medicine and Surgery, Theriogenology, Parasitology, Microbiology, Livestock Management, ABG, Nutrition, Zoology and Continuing Education and Extension, were visited. Discussion was held among the students, faculty members, farmers and the civil society activists regarding collaborative initiatives. DSP Southern Punjab Chapter and a Livestock Business Support Center (LBSC) would be established at CUVAS as envisioned under the consultative process of DSP made with FAO and ITC-UN.

Mr MAKS Hashmi travelled to Islamabad and granted Golden Camel Award 2023 to Prof M Mukhtar Former Vice Chancellor IUB and present VC Skills University Islamabad in recognition of his initiative of the first camel conference in 2013.

***vii. Int Solar Expo 2024***

The First International Solar Expo and Conference #ISE2024 was held on June 1-2, 2024. The Event was organised by Prof M Subhan Qureshi, as Chief Patron GreenWend Energy Pvt Ltd/SunSaviour and President Dairy Science Park, Engr Zeeshan Saeed Shah CEO, Engr Saad Rashid CTO, Engr Irfan ul Haq Qureshi Coordinator General, senior staff of SunSaviour and Volunteers. The Event was attended by delegates from the industry, civil society, academia and government organisations.

Industrial products, services and academic contributions were displayed through 30 stalls by private companies and universities. Three Panel Discussions were held, participated by 22 senior academicians and industry leaders. Keynote lectures were delivered by 7 notable leaders from academia and industry. Ten postgraduate scholars and researchers presented their research findings and ideas through powerpoint while 16 posters were presented by young scholars. Three top presenters were awarded cash prizes of Rs.50,000, Rs.30,000 and Rs.15,000, respectively. All the delegates were provided certificates of attendance on request.

Mr Ghulam Ali, Ex-Governor KP inaugurated the Event as the Chief Guest. He compared the status of Kashgar and Peshawar during meetings of the respective Mayors during 1983 and highlighted the tremendous potential of development for this region. The current event was the best model of engaging the educated youth in productive activities. GreenWend Energy was demonstrated as the best startup model in delivering solar energy services to the residential and commercial entities. Its products wing, the SunSaviour developed advanced versions of the inverters and lithium ion batteries, produced the same in Chinese factories and marketed in Pakistan with higher acceptance levels of the consumers. The best option for our youth would be to launch their solar energy related business setups for overcoming the energy, employment, environmental and financial crisis prevailing in the country.

President, Sarhad Chamber of Commerce and Industry (SCCI), Mr Fuad Ishaq chaired the Concluding Session. The President SCCI urged the government to take steps to promote the solar and green energy sector, which is the only way to fulfil the growing energy needs of the country that will not only provide a clean environment but also create employment opportunities. Keeping in the prevailing scenario, the SCCI chief identified solar energy as the only path to overcome the increasing energy crisis and needed to encourage this important sector at governmental level. He agreed on the Recommendations presented by Prof M Subhan Qureshi, Chief Patron ISE2024 and establishment of a Steering Committee on Solar Energy to oversee the issues faced by the to: 1) oversee the issues faced by the stakeholders; 2) facilitate the ongoing university graduates to establish entrepreneurship models and; 3) to work on reducing the burden on public treasury through solarization of the state owned entities like universities, schools, colleges, offices, tubewells, etc.

*Recommendations*

Based upon the advice of the Chief Guest of the Inaugural Session, Haji Ghulam Ali, Ex-Governor Khyber Pakhtunkhwa and Ex.Member Senate of Pakistan and Chairperson of the Senate Committee on Commerce and Textile Industry; advice of the Chief Guest of the Concluding Session, opinion of the members of the Panel Discussions and the Audience, the following recommendations are presented:

- The recent bloom in the solar industry through investment of private sector and the residential and commercial consumers have resulted in expansion of the volume of business several folds (1.41 GW in 2024), but rumours of unjustified taxing of the consumers instead of incentivizing it, is resulting in an unrest among the people. A duty of about 40-50% has been imposed on import of inverters and lithium batteries, which is

strange as the solar panels have been exempted from such duties. Hence, we recommend that Solar Energy Applications must be taken as a higher priority policy item at federal and provincial levels through legislative, administrative and financial coverage.

- The practice of approval of the green energy meters for the solar systems installed in the province is troublesome for the consumers as it takes a very long time and passes through many hands expecting illegal favors. A transparent, user-friendly, online system may be introduced for allotment of GreenWend energy meters to the consumers after uploading the essential document and the government approved fees.
- The outgoing graduates from the universities would be facilitated in establishing solar based business setups in manufacturing, marketing or service delivery. ORIC offices of the Universities would be tasked to oversee such activities in coordination with the local and international solar companies, investors and donor agencies through an appropriate Endowment Fund not less than Rs.2 billion to be managed jointly by a 15-members Steering Committee of the private and public sector organisations, hosted by SCCI. Successful models like Inverex, GreenWend Energy, SunSaviour, Sky Electric, Tesla Pakistan would support the Committee in identifying startup models.
- Financial Institutions would provide access to easy finance for such startups. The State Bank of Pakistan and Bank of Khyber would allocate special packages for supporting this initiative.
- Manufacturing solar energy devices within the country and through joint ventures abroad, must be supported through an incentive package, covering regulatory, financial and marketing aspects, as an import substitution measure.
- A special package may be provided for solarizing of the vulnerable families and individuals and houses located in the remote regions, with meagre power consumption, through reduced costing.
- The Solar Energy sector may be provided legislative cover, not to be affected by political disturbances.
- Bureaucratic hurdles usually hinder the development process in the country in spite of a strong political will for change; which needs to be overcome through legislation.
- Universities may introduce postgraduate training and degree programs in designing, manufacturing, marketing and entrepreneurship development.
- Food Security may be ensured through Solar Energy Applications like water pumps, solar dryers, pest control, electric fences in livestock farms, solar tractors and other farm vehicles, solar greenhouses, solar cold storage, solar sensor and monitoring systems, solar irrigation controllers, solar grain mills, may be introduced. China, India, Kenya, Netherlands and the USA have adopted such technology resulting in boosting agriculture and livestock productivity.
- The issue of payment to Independent Power Producers (IPPs) has been a permanent headache for the government, national exchequer and the common man. A serious dialogue may be initiated with the IPPs and a one time Golden HandShake must be made to get rid of these chronic issues.

- Training accreditation and certification of service providers, installers, engineers, and technicians to ensure the quality of services and inputs to the clients of solar energy applications.
- A Steering Committee on Solar Energy (SCSE) will be established at Sarhad Chamber of Commerce and Industries to: 1) oversee the issues faced by the stakeholders; 2) facilitate the outgoing university graduates to establish entrepreneurship models based upon their academic wisdom, in manufacturing and services in solar energy and; 3) to work on reducing the burden on public treasury through solarization of the state owned entities like universities, schools, colleges, offices, etc. The SCSE will be backed up by an Endowment Fund of Rs.5 billion and will comprise membership from 4 universities, 3 private companies, 2 government departments, 2 civil societies and 2 SCCI.

***viii. The NESS Congress Series***

*The 2024 NESS Congress*

Prof Muhammad Subhan Quershi, President Dairy Science Park Pakistan and Chief Patron SunSaviour Pakistan attended the 2024 International Congress on an Eco-Security System for All People along the Belt and Road at Shennongjia National Park of Hubei Province on May 27 to 30, along with Prof Sher Bahadar Khan, Principal CAHVS, AWKUM Mardan. The Congress was a follow up of the concept presented at the 2017 annual meeting of the World Economic Forum in Davos, by the Chinese President Xi Jinping, a Chinese plan: "Building a Community with a Shared Future for Mankind (CSFM) to achieve win-win sharing". The concept of building a CSFM has been written into many resolutions of the UN and is recognized and endorsed by more and more countries.developed by the National Eco-Security System (NESS) International Science Network, Haikou Forestry Bureau, and Hainan Normal University, together with the other 22 co-organizers.

The 2024 Shennongjia International Congress on An Eco-Security System for All People along the Belt and Road took place from May 27th to 29th. Fifty experts and scholars from 48 countries, along with 33 international students from 32 countries—totaling 83 participants from 71 countries—convened in Shennongjia. Additionally, 44 countries joined the event online. The meeting was attended by representatives of the Academic Committee of the Congress, species and protected area experts, organizations, young volunteers, news media, and officials from departments of Shennongjia Forest District, including the Party Committee, National

People's Congress, Government, and Chinese People's Political Consultative Conference. A total of 318 delegates participated in the congress, focusing on shaping the "An Eco-Security System for All People along the Belt and Road." Their discussions aimed to contribute expertise towards fostering the harmonious coexistence of humans and nature and building a shared future for mankind.

Tian Dexin, the Founder and Chief Scientist of the NESS International Science Network and the Editor-in-Chief of the Global Development Report on "An Eco-Security System for All People" (also known as the "NESS Global Report"), delivered a keynote speech outlining the theme of "An Eco-Security System for All People." He discussed the strategy and roadmap for encouraging nations worldwide to establish their own academic communities focused on National Eco-Security Systems (NESS). This initiative aims to build NESS for the future of their children and all people, and globally joint construction of "An Eco-Security System for All People". Additionally, Tian Dexin provided insights into the NESS Global Report and the "NESS Index" for various countries.

Liu Qijun, the Mayor of Shennongjia Forestry District and Director-General of the Administration of Shennongjia National Park, presented on the topic of "Beautiful Shennongjia·China's Model·International Paradigm." He emphasized that by integrating strategic positioning and practical initiatives in Shennongjia, the region aims to establish a Chinese model for ecological civilization construction and be a global benchmark for biodiversity conservation. Shennongjia will actively study and implement ecological civilization principles, mobilize societal resources to advance ecological civilization construction, and expedite the harmonious coexistence of humans and nature as part of China's modernization efforts.

Ouyang Zhiyun, a Foreign Academician of the U.S. National Academy of Sciences, Director of the CAS Research Center for Eco-Environment Sciences, and Director of the National Park Institute at the National Forestry and Grassland Administration of China (NFGA), provided a detailed analysis on the topic of "Characteristics of China's Biodiversity and the Construction of Protected Areas System." He highlighted that China has made significant strides in biodiversity conservation in recent years, with the government demonstrating a strong commitment to this cause. Despite these achievements, biodiversity conservation in China faces numerous challenges, such as declining ecosystem quality and varying degrees of forest and grassland degradation. Preserving biodiversity necessitates a comprehensive and collaborative effort involving society as a whole.

Komil Tojibaev, member of the Academy of Sciences of Uzbekistan and Director of the Institute of Botany of the Academy of Sciences of Uzbekistan, described the importance of plant diversity and protected areas in Central Asia in the conservation of endangered species and mentioned their potential value in building An Eco-Security System for All People.

Ronald Kaboye, a Lecturer at the Kayonga Institute of Agriculture and Environmental Protection at Makerere University and the National Director of the Man and Nature Uganda Project, has spearheaded remarkable efforts in advancing the Uganda NESS. He has successfully built a robust scientific network for Uganda NESS and presented a progress report on its development, sharing his successful

experiences in the field.

Muhammad Subhan Qureshi, President, Dairy Science Park; Professor, Khyber Pakhtunkhwa Agricultural University, also led the development of Pakistan NESS Science Network. He reported the progress report of Pakistan NESS and shared the successful experience with countries around the world.

At the conclusion of the opening ceremony, Mr. Tian Dexin chaired the launch ceremony of the "An Eco-Security System for All People along the Belt and Road." Experts or student representatives from 71 countries took turns coming onstage to light up their respective countries, while an additional 44 countries joined the ceremony online.

On 27-28, around the theme, the participants held academic workshops on the theme, including NESS International Theme Forum, International Youth Forum, Protected Area Forum, and Species Forum.

All experts from the Belt and Road Initiative countries who attended the meeting wholeheartedly endorsed the NESS concept and its operational approach. They expressed their readiness and determination to actively champion NESS-related endeavors in their respective countries upon their return. On May 30, Tian Dexin conferred the certificate of a member of the international editorial board of the NESS Global Report upon 53 experts from 50 nations, with an additional 7 international students receiving the certificate of young editorial member. The Shennongjia Congress has planted seeds across more than 150 countries, with some already beginning to take root and grow. The Shennongjia Congress is poised to be a significant milestone in the collective journey of "jointly constructing An Eco-Security System for All People along the Belt and Road Initiative."

*The 2022 NESS Congress*

The 2022 NESS Congress proposed to the international scientific community and scientists from all over the world the following initiative call: i) the scientists, universities, scientific research institutes and other institution in various countries to pay close attention to the Eco-Security bottom-line necessary for the long-term survival of the children of ourselves and our own countries, and to actively support and participate in relevant scientific research and collaborative actions in their countries and; ii) the international scientific community, universities, research institutions, and international organizations to pay attention to the Eco-Security targets needed for the sustainable survival of all children and mankind around the world, form consensus and actively support and participate in relevant scientific research collaborations and joint actions around the theme of establishing “an Eco-Security System for All”.

Certain guidelines were agreed upon, in the online meeting between DSP and NESS-ISN representatives for NESS Pakistan. Eco-security concepts are being introduced among local community and public/private support organisations.

*The 2023 NESS Congress*

The 2023 NESS Congress was organized on the basis of "Jointly Building An Eco-Security System for All People, with the theme: (i) The important value and role of protected areas to NESS; (ii) How can law science provide robust legal guarantees and support for building ESSAP?; (iii) How can nature education in different countries provide robust support for jointly building ESSAP?; (iv) How can species research and conservation provide scientific support for ESSAP, and describe the close relationship between species conservation and NESS and; (v) How can young international students support the NESS research and development for their own countries?

The 2023 NESS Congress included opening ceremonies, the main congress, and five international sub-forums, with participation from 129 countries. Among the participants, 39 countries, such as Kazakhstan, the UK, Kenya, South Sudan, India, Laos, the Philippines, Uganda, Chile and Malaysia, attended the event in person, 44 countries participated online, and 46 countries engaged in communication via email. NESS International Contact Persons were identified for 26 of these countries.

During the Congress, there were five sub-forums, covering topics related to law science, species conservation, protected areas, nature education, and young international students. More than 90 academic reports were presented, featuring in-depth discussions on how to promote and implement the research and development of NESS in various countries. Both online and offline experts in attendance engaged in comprehensive discussions and communication, sharing their experiences and best practices. The"One Target" of collectively establishing "An Eco-Security System for All People" received broader international recognition and garnered consensus among experts from around the world, laying a solid foundation for future international scientific communication activities in this field.

The 2024 Congress was attended by delegates from above 60 countries in addition to several United Nations and other international organizations. Videos produced by various countries were played in the inaugural session. It was followed by a session on "Jointly Building An Eco-Security System for All People along the Belt and Road". Mr Dexin Tian, Founder & Chief Scientist, NESS International Science Network; Editor in Chief, presented the Global Development Report on An Eco-Security System for All People. Two country reports were presented by Ronald Kaboye and Prof M Subhan Qureshi for Uganda and Pakistan Respectively. The Founder of NESS-ISN Beijing, Mr Tian Dexin referred to Pakistan's Report as a model to be followed by other countries. NESS-Pak has successfully engaged 203 persons and 98 institutions.

The following workplan was presented: a) National Research Center for National Eco-Security System Pakistan (NRC-NESS-Pak) will be established at AWKUM Mardan; b) IRAD AWKUM Conference papers will be shared with NESS for their international database; c) The next International NESS Conference will be held at AWKUM in cooperation with NESS-ISN Beijing; d) The Preparatory Committee NESS-Pak will hold National Workshops in coordination with HEC/PSF and other sponsors for issues identification and strategy development to respond to the issues. At the Species Forum on May 27 a session was held on Principles for Species Research and Conservation Priority Setting. Prof Qureshi presented a paper on "Exotic High-Yielding Animals Threaten Indigenous Species".

The International Contact Persons from various persons were urged to get more supporters for the initiative of Eco-Security for All Peopl (ESAP) so that the regional and global report could be compiled and shared with the head =s of the states for implementation.

***ix. The One Health Conference Series***

*One Health Conference 2025*

The Honourable Prof Sarzamin Khan, Member Board of Trustees, Pakistan Science Foundation Islamabad inaugurated the Conference as Chief Guest, alongside Prof. Saleem Ullah Khan, representing the Vice Chancellor of AWKUM, and Prof. Dr. Sher Bahadar Khan, Principal of the College of Animal Husbandry and Veterinary Sciences (CAHVS).

Mr. Khan commended the efforts of the organizers, sharing recent research support programs for promotion of Scientific Research and related activities in the areas of Agricultural Sciences, Biological Sciences, Bio-technology and Genetic Engineering, Chemical Sciences, Computer/Information Technology, Mathematical Sciences, Environmental Sciences, Engineering, Earth sciences, Medical sciences and Physics. The Foundation provides grants to universities and other R&D organizations for projects undertaken by individuals or groups of scientists.

The Foundation has developed requisite infrastructure for carrying out its research support activity. The Foundation has so far funded 1031 research Projects in various fields of Science and Technology that have resulted in publication of 612 research papers in national and international journals and 5 patents have been filed from PSF sponsored projects. 169 research scholars have acquired their M.Phil degrees and 115 have done their Ph.D.s out of work done in PSF supported research projects.

The conference was co-organized by Prof. M. Subhan Qureshi, President NESS-Pak/DSP; Dr. Muhammad Israr from PSF, with institutional support from various departments of AWKUM, Dr. Iqbal Iqbal, Dr Tahir Usman, and Dr. Imad Khan and other colleagues. Prof M Subhan Qureshi presented the National Eco-Security System Global Report 2024 Pakistan Volume and informed the delegates about achievements of NESS-Pak during the period.

The Report was prepared by the Editorial Committee headed by Prof. Muhammad Subhan Qureshi, Secretary General and Deputy Editor-in-Chief, Editorial Committee for Pakistan Volume of NESS Global Report/Member, International Editorial Committee for NESS Global Report/President Dairy Science Park. Prof Sher Bahadar Khan, Principal Veterinary College AWKUM and Dr Shahid Iqbal assisted as

Deputy Secretary General and Vice Secretary General of the Report. There are 496 higher education, research, Government and other institutions (HERIs) affiliated with NESS Pakistan, out of which 104 (21.0%), 54 (10.9%) and 338 (68.1%) have made institutional, individual and no promises yet, respectively. As of May 2025, the number of members of the Editorial Committee has been: 115 Editorial Committee (EC) members for Pakistan Volume of NESS Global Report, as well as 15 Youth Editorial Committee (YEC) 1 members were identified, with 3 executive members totaling 133 from various HERIs. A total of 605 persons have got registered as NESS Supporters through NESS-Pak.

A letter from Mr Tian Dexin, Chief Scientist NESS, ISN shared a letter with the participants, highlighting the need for a collective response to the challenges to the Eco-Security around the Globe. He appreciated the progress made and assured his support to the NESS-Pak. Prof. Dr Muhammad Azam Kakar, Pakistan, FAO Quetta presented his paper titled, "Long-Term Human Survival through National Eco-Security Systems: Building Resilient Food Systems through FAO Pakistan. Prof. Dr Alireza Sazmand (Iran) shared his paper on "To drink or not to drink, that is the question: contamination of spring waters with the protozoan parasites". Dr Irshad Khattak presented his paper on "Exosomes as Emerging Trend in Regenerative Medicine". The National Eco security system was assigned to the Speaker Prof. Dr Yan Xie (China).

The Integrated Role of Industry, Academia and Regulators to Ensure SDG-3cc (Good Health and Wellbeing was presented by Mr. Mian Abdul Rasheed, Pakistan Agricultural Scientists Forum. Dr Faisal Siyal Scientist FDA OHIO STATE University (USA) was assigned a talk via video link as well as Dr Noor Bahadur (China). Dr Aqib Iqbal presented his paper on Machine Learning Model Based on FTIR Spectroscopy and Chemometrics for the Identification and Classification of Thyroid Malignancies. Technical Sessions were held on Poultry Science and Biosecurity. Abstracts were submitted online, evaluated by the technical committee, and selected for oral or poster presentations. Poster presentations were assessed for prizes and certificates. The Editorial Committee of NESS convened a hybrid meeting with in-person and remote participants.

During the concluding session, chaired by the Vice Chancellor, the conference recommendations were presented as follows: Conference Recommendations

- 1. Environment Protection: Conduct interdisciplinary research through affiliated institutions on the nine planetary boundaries (Biosphere integrity, Climate change, Novel entities, Freshwater change, Land system change, Biochemical flows to the oceans, Stratospheric ozone depletion, Atmospheric aerosol loading, and Ocean acidification), emphasizing the former six that have already been transgressed globally. Develop targeted policy recommendations as a response strategy, ensuring a collaborative approach involving academia, government, and civil society for effective implementation.
- 2. Biodiversity Conservation: Ensure the responsible introduction of genetically improved animal and plant species, with measures to prevent their invasiveness and protect native biodiversity; Safeguard Pakistan's rich biodiversity, focusing on the preservation of flora and fauna within

protected areas; Promote community-led biodiversity conservation through education, awareness campaigns, and local empowerment initiatives.

- 3. Food Security: Foster sustainable agricultural and livestock practices to enhance food production and resilience against climate change; Facilitate the development of value chains to generate exportable surpluses and ensure equitable distribution of food resources.
- 4. Renewable Energy: Promote the development and integration of renewable energy solutions to reduce reliance on fossil fuels, mitigate environmental impact, and support sustainable livelihoods in protected areas and rural communities.
- 5. Public Health: Strengthen the One Health approach to address the interconnection between human, animal, and environmental health; Implement bio-risk management programs to prevent zoonotic diseases and enhance disease surveillance in protected areas.
- 6. Livelihood Security: Create sustainable employment opportunities for local communities through eco-tourism, conservation efforts, and value-added agricultural products; Support the establishment of small and medium enterprises (SMEs) aligned with eco-security and sustainable development principles.

*One Health Conference 2023*

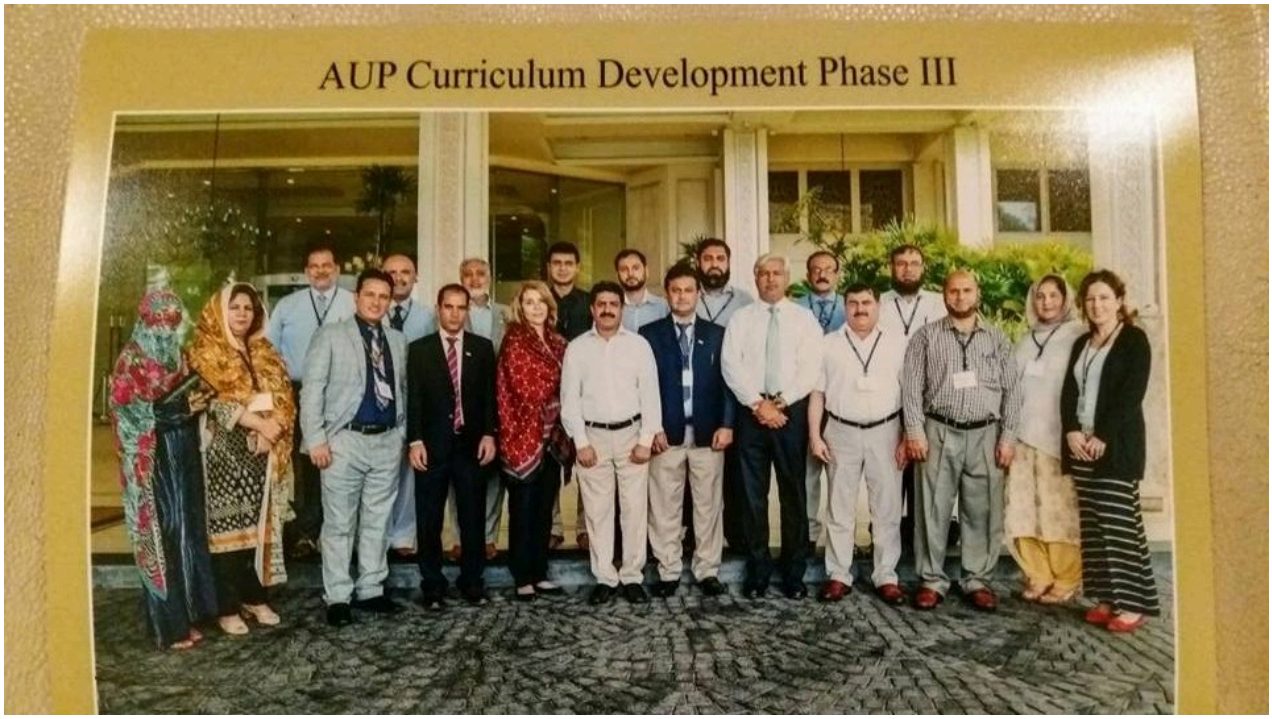
National Eco-Security System Pakistan (NESS-Pak) was represented at the 1ST INTERNATIONAL CONFERENCE (IRAD-2023), RECENT TRENDS IN IMPROVING RESISTANCE AGAINST DISEASES USING MOLECULAR GENETICS AND OMICS TOOLS held on December 6-7, 2023 at ABDUL WALI KHAN UNIVERSITY MARDAN, PAKISTAN. Prof Dr Muhammad Subhan Qureshi, President NESS-Pak/President DSP presented his paper on "Integrated approach for maintaining eco-security in Pakistan under NESS-PAK" and Mr Tian Dexin, Founder and Chief Scientist NESS International Science Network, Beijing made a presentation on "Jointly build an assured future of Eco-Security system for all children".

Experts from China, USA, Thailand, Turkey and Afghanistan are taking part in the conference besides national experts. We are very thankful to Prof Dr Zahoor Ul Haq, Worthy Vice Chancellor, Director ORICs, Director administration, provost office, Registrar, Treasurer's office, IT office for their wonderful support in making it happen.

*One Health Conference 2024*

OHC2024 featured an Inaugural Session, Plenary Session, and specialized sessions on Health, Poultry, National Eco-Security System, Biosecurity, Agriculture, Industry, Academia-Industry Interaction, and an Industrial Exhibition. Abstracts were submitted online, evaluated by the technical committee, and selected for oral or poster presentations. Poster presentations were assessed for prizes and certificates. Mr Tian Dexin, Founder NESS-ISN and Dr Yan Xie, International Coordinator NESS-ISN presented salient findings of the NESS Global Report 2024. The Editorial Committee of NESS convened a hybrid meeting with in-person and remote participants. During the concluding session the conference recommendations were presented.

## b. Biorisk Management




***The Colombo Meeting:***

A delegation of Dairy Science Park (DSP), The University of Agriculture, Peshawar, Pakistan completed their consultation on Biorisk Management (BRM) with Sandia National Laboratories (SNL) USA at Columbo, Sri Lanka. The delegation of DSP was led by Mr Arif Yousaf, Special Assistant to Chief Minister on Law/Convener Task Force on Sustainable Development Goals, Government of Khyber Pakhtunkhwa and comprised Prof M Subhan Qureshi Chief Patron DSP, Prof Nazir Ahmad Dean FAHVS, Prof Umer Sadique, Dr Shoaib Sultan, Dr SB Khan, Dr Farhan A Khan, Dr Hamayun UAP, Prof Ghazala Yasmeen VC WUM, Prof Azam Kakar World Bank, Mrs Javed Farmer Sausage Co, Irfan Qureshi and Sadia Qurehi DSP, M Inam SSBU Sheringal, Dr Arshad PVMC, Prof M Rabbani UVAS and Dr Tayyab KMU. The Sandia team comprised Dr Melissa Finley, Mr Waleed Joyan and Ms Iris

A BRM Package was developed for integration into DVM curriculum at Pakistani Universities under the supervision of Pakistan Veterinary Medical Council. The draft has been uploaded at Link https://dairysciencepark.org/wp-content/uploads/2020/09/BRM-DVM-Curriculum-Integration.pdf.

***The Netherlands meeting:***

A collaboration on "Biorisk Management" is in process with the Sandia National Laboratories (SNL) USA. A four-member delegation of the Park visited the Netherlands on March 15-18, 2015 for launching the initiative. The tour was sponsored by the United States Department of State's Biosecurity Engagement Program and Sandia National Laboratories. The One Health concept is based on the recognition that human and animal health are inextricably linked. SNL were represented by Dr Melissa Finley and Mr Robert Otero and DSP by Prof M Subhan Qureshi, Prof Sarzamin Khan, Prof Umer Sadiq, Dr Shakoor Ahmd and Mr Imran Khan. A presentation was made by Prof M Subhan

Qureshi, covering the livestock production system in the Khyber Pakhtunkhwa province and FATA regions of Pakistan, rich in natural resources hit by extreme poverty.

The livestock and poultry farming system are lacking quality control standards and lack of access to modern practices have an adverse effects on the profitability of these operations economically. Similarly the processing facilities and marketing outlets are run without quality control practices and any documentation for traceability. The Doctor of Veterinary Medicine degree program is focusing on treatment of diseases and lack appropriate concepts on Biorisk Management. The SNL delegates desired to collaborate with the Dairy Science Park in establishing a Center of Excellence on Biorisk Management.

***The Dubai meeting:***

A 9-members delegation of DSP and a 4-members delegation of Sandia National Laboratories USA met in Dubai to hold the Pakistan Biorisk Management Curriculum Workshop during May 21-25, 2016. SNL was represented by Dr Melissa Finley, Veterinarian; Iris Shurdhi, Development Expert; and Giulio Mancini (Global Security Expert). DSP was represented by Prof M Subhan Qureshi, Chief Patron; Prof Sarzamin Khan, Chief Technical Advisor; Engr Irfan ul Haq Qureshi, Chief Executive; Prof Umer Sadique, Advisor One Health; Mr Nasir Shah, Advisor Higher Education; Mr Rashid Aman, Expert Entrepreneurship; Dr Shakoor Ahmad, Expert Quality Control; Ms Sadia Qureshi, Expert Halal Food; and Ms Samina Qureshi, Expert Economics (Guest Participant). The DSP participants belonged to the University of Agriculture, Peshawar, Higher Education Commission of Pakistan, SMEDA, and the Private Sector.

The Workshop concluded that the curriculum in practice in various universities of Pakistan under the supervision of Higher Education Commission of Pakistan needs to be mapped and reviewed for presence of Biorisk Management contents or availability of a full fledged teaching program at undergraduate or graduate levels. Keeping in view the importance of the subject, the participants recommended that Biorisk Management may be given appropriate consideration while developing teaching programs at national level.

***The Bangkok meeting:***

Mr Arif Yousaf, Special Assistant to the Chief Minister (Law), Government of Khyber Pakhtunkhwa, Pakistan, who is also representing the province as a member of Task Force on SDGs, led a fifteen members delegation of Dairy Science Park Peshawar to attend a consultative workshop at Bangkok, Thailand from 12 to 19 November. Prof M Subhan Qureshi Dean FAHVS/Chief Patron DSP, University of Agriculture, Peshawar, Pakistan; Prof Umer Sadique, Prof Sarzamin Khan (UAP), Dr Zia ul Haq (KMU), Mr Nasir Shah (HEC) and Engr Irfan ul Haq (DSP) and Mr Kamran Khan (farming and industry) represented DSP. The workshop focused on Curriculum Development for Pakistani and regional universities and is sponsored by the Sandia National Laboratories USA.

The workshop evaluated the biorisk contents of curricula in place at various universities. Recommendations were prepared for standardizing the courses and accommodating the concerns of the local livestock/poultry farming, products processing, marketing and quality control systems present in the region.

***The Phuket meeting:***

An awareness workshop was held at Phuket, Thailand, participated by experts of Dairy Science Park (DSP), Peshawar, Pakistan and Sandia National Laboratories (SNL), Albuquerque, NM, USA. The meeting was held on 19th to 21st April, 2017. The workshop was focused on awareness of the policy makers about the biorisk management (BRM) concepts and identifying the areas of interventions into the functions of government, academia and private sector organizations, with special focus on documenting and improving the status of biosafety and biosecurity associated with laboratory operations, clinics and the human food chain. In addition, the integration of Biorisk Management Curriculum into the existing curricula of Pakistani Universities and development of new courses with the coordinated efforts of the provincial and federal governments, private sector and civil society were considered.

During various presentations, the participants discussed the issues in detail and suggested measures through collaborative efforts of all stakeholders led by the DSP-SNL partnership. The recommendations are summarized as follows:

i) Dairy Science Park would train Food Safety Officers and develop quality and Halal standards with the cooperation of development partners like SNL, KMU and others. Diagnostic kits will be developed for detection of pathogens, toxins and Halal quality. A development project may be sponsored by the provincial government for this purpose.

ii) The provincial government is considering establishment of a Dairy Science Park Task Force (DTF) to take care of interests of the producers, processors, consumers and service providers through various ministries. An earlier notification of the DTF was recommended.

iii) The SDGs Task Force, Provincial Assembly KP must review the provincial priorities under SDGs and the sectoral policies and development plans must be tailored with the SDGs priorities;

iv) The STF comprising parliamentarians must be supported by a group of technocrats to identify peoples' issues related to SDGs. Intervention strategies were suggested related to food safety, food security and youth entrepreneurship as covered under SDGs number 2, 3 8; accepted by the United Nations as #SDGAction9671 initiated by DSP.

v) Establishment of community colleges under FATA University with the collaboration of DSP, to develop capacity of the people for utilizing indigenous resources for poverty alleviation, hygienic food production and youth employment.

vi) Dr Azam Kakar from the World Bank Quetta suggested establishment of the Baluchistan Chapter of DSP to develop livestock resources, especially the sheep population on a commercial basis. It was suggested that the local resources in KP and Baluchistan need to be developed through special economic zones, based upon availability of the local livestock, poultry and wildlife populations. Higher Education has introduced tools of ORIC offices/Business Incubation Centers at various universities,

which will be utilized by DSP through partner universities and the private sector.

vii) The security personnel may be trained in biorisk management so that their health could be protected and good practices could be introduced at the international borders for protecting the health of animals and the people. In addition, the capacity of the laboratories may be enhanced to handle forensic samples. It was recommended that:A Center of Excellence on Biorisk Management (CE-BRM) will work on development standards.

viii) A Center of Excellence on Biorisk Management (CE-BRM) will work on development standards and imparting training to the biomedical workers and related professional groups in biosafety and biosecurity. CE-BRM will be established at Peshawar to be jointly managed by various partner universities of DSP.

ix) To bring reforms into the structure and function of HERA in public interest and to utilize resources of the KP Board of Investment and Trade to support the small businesses engaged with food production in reducing cost of production and reducing risk of food related risks to the public health. The performance of various departments needs to be reviewed through a questionnaire to be monitored by the Finance Minister.

x) The personnel trained under the SNL-DSP collaboration would be registered as alumni and the provincial government will implement the good practices in biorisk management at various points of the food value chain, as a part of KP DSP Act of the provincial Assembly.

xi) Upgradation of the biological laboratories to BSL-2 and 3.

xii) Pursuant to the recently promulgated KP Food Safety Authority Act 2014, it was recommended to revise the Act in light of the BRM and entrepreneurship challenges in the food value chain, with support of the academia-industry partnership.

xiii) DSP will coordinate with the local and regional universities/organizations to accommodate Biorisk Management courses at provincial, national and regional levels

***The Konya Session:***

The Biorisk Management Session was held during the Fourth International Conference and Industrial Exhibition on Dairy Science Park at Selcuk University Konya, Turkey during November 1-5, 2017. The session was managed by: Chairman: Prof. Dr. Ghazala Yasmeen, Vice Chancellor, WU Mardan, Pakistan; Co
Chairman: Prof.Dr. Yılmaz Bahtiyarca, Selcuk University, Konya, Turkey; Moderator: Rifat Ullah, AUP, Pakistan. Seven papers were presented during the session.

***The Amman Meeting:***

A delegation of Dairy Science Park attended a workshop on The Use of Research Methods and the Role of Molecular Biology, hosted by Sandia National Laboratories (SNL, USA), in Amman & Irbid, Jordan from 29 April – 1 May 2018. Dairy Science Park, University of Agriculture Peshawar was represented by Prof M Subhan Qureshi, Chief Patron DSP, Prof Nazir Ahmad Dean FAHVS, Prof Umer Sadique Chairman Animal Health

and Dr Farhan Anwar Assistant Professor. Prof Masood Rabbani represented UVAS Lahore and Prof Zafar Randhawa, Dr Tariq, Dr Faqir Muhammad, Dr Kasib and Dr Shafia represented UA Faisalabad. Dr Melissa Finely and Dr Lynn Fondren represented SNL.

On the first day a review of the training workshops and basic concepts of biorisk management were presented by Dr Melissa Finley and Dr Lynn. It was followed up by a review of the facilities and strength of the three Pakistani Universities and Dairy Science Park regarding availability of manpower, laboratory resources and academia industry linkages. The missing links and gaps were identified, with special reference to availability of molecular biological techniques at these institutions. On the second day the Princess Haya Biotechnology Center (PHBC), MENA BioRisk Management and Genomic Training Division (BRMTD), Jordan University of Science and Technology, Irbid, was visited.

***The Dubai Meeting-II:***

A Workshop was held at Dubai on Biorisk Management, organized jointly by Dairy Science Park Peshawar, Sandia National Labs USA and Pakistan Veterinary Medical Council Islamabad. This was the eighth event of the series held at different locations around the World. BRM contents were developed for integration into DVM degree curriculum at Pakistani Universities. Participants from Sandia National Laboratories included Dr Melissa Finley, Mr Waleed Joyan and Ms Iris Shurdhi. Delegates from Pakistan comprised Deans and senior faculty members from the DVM degree awarding institutions of Pakistan; senior civil officers of the federal and provincial government, Pakistan Veterinary Medical Council and Dairy Science Park. Lectures were delivered by the resource persons from Sandia Labs USA and President PVMC. BRM related issues prevailing in the field were reviewed. Integration of the BRM contents into the DVM curriculum, already developed at Colombo and refined in the Deans meeting in Pakistan, were discussed in detail in three groups. Final draft was presented on the third day for integration into DVM Curriculum. Prof M Subhan Qureshi suggested establishment of BRM Alumni Association as the eight workshops jointly organized by SNL, DSP and PVMC have trained a good number of persons which may play their due role in integrating BRM concepts into the Food Value Chain in Pakistan.

*Collaboration between DSP and SNL-USA launched at Amsterdam during March 2015*

**Dairy Science Park – Sandia National Laboratories USA Collaboration**
**Pakistan's BRM Curriculum Development**
**DVM National Curriculum**

| DVM Semester | BRM Courses Integration | BRM Knowledge Level |
|---|---|---|
| **Semester 1:** | ***No integration*** | |
| **Semester 2:** | • General Veterinary Microbiology ***(Basic concepts of biosafety/biosecurity *BS&S in microbiology lab practical session)*** | • Introduction to the BS&S, relevant terminologies and required examples *During* Lab practical<br>○ 1 contact hour required |
| **Semester 3:** | • General Veterinary Pathology ***(Basic concepts on sample collection and sample transportation)***<br>• Molecular Biology ***(BRM intro – AMP model –basics only)*** | • Basic sample collection and transportation concepts *During* the Practical session of tissue processing through adding dual use of research project ideas.<br>○ 1 contact hour required<br>• Intro to BRM and basics AMP model<br>○ 1 contact hour required |
| **Semester 4:** | • Livestock Feed Resources and Forage Conservation ***(BRM Risk Assessment, basics of hazards/threats Identification and risk characterization process)***<br>• Veterinary Bacteriology and Mycology ***(Basic concepts of Good Lab Work Practices *GLWP and Personal Protective Equipment *PPE)***<br>• Systemic Veterinary Pathology ***(Intro to SOPs development and Basic concepts of Decontamination process)*** | • BRM Risk Assessment process with basic concepts of hazards/threats Identification and risk characterization *During* Theory session<br>○ 1 contact hour required<br>• Basic intro to Good Lab Work Practices *GLWP and Personal Protective Equipment *PPE *During* Practical session<br>○ 2 contact hours required<br>• Introduction to SOPs development and basic concepts of spill kits/Decontamination process *During* Practical session<br>○ 1 hour contact hour required |
| **Semester 5:** | • Veterinary Clinical Pathology ***(Risk Assessment –hazard/threats identification process and Risk communication)*** | • Intermediate Risk assessment – hazards/threats identification process and Risk Communication *During* practical session<br>○ 1 contact hour required |

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**Dairy Science Park – Sandia National Laboratories USA Collaboration**
**Pakistan's BRM Curriculum Development**
**DVM National Curriculum**

| | | |
|---|---|---|
| | • Veterinary Virology ***(Intro to Biocontainment facilities)*** | • Introduction to the concept of risk group organisms, Biocontainment facilities and BSL levels *During* Theory and Practical session<br>○ 1 contact hour required |
| | • Islamic Studies/Ethics ***(Bioethics)*** | • Introduction to the Bioethics Concepts *During* Theory session<br>○ 1 contact hour required |
| **Semester 6:** | • Medicine Clinic-I ***(Basic Field Biosecurity and Characterization of Waste Disposal)*** | • Introduction to the basics of Field Biosecurity and the characterization of biological wastes disposal *During* Clinical session<br>○ 1 contact hour required |
| | • Theriogenology Clinic – I ***(Animal health worker's safety and security)*** | • Introduction to animal health worker's safety and security *During* Clinical session<br>○ 1 contact hour required |
| | • Zoonoses and Food Safety ***(Planning and Assessment- 6 topics from policy planning of BRM)*** | • Basic introduction to the concepts of BRM Planning and Assessment *During* Practical session<br>○ 1 contact hour required |
| | • Meat Inspection and Necropsy Practice ***(Intro to PPE, Bio Waste management and disposal, Documentation and proper reporting for QA/QC)*** | • Introduction to the concepts of PPE, Waste management system, Documentation and proper reporting for QA/QC in meat inspection and Necropsy practices.<br>○ 2 contact hours required |
| **Semester 7:** | • Veterinary Preventive Medicine-II ***(Developing need assessment and building Human capacity for BRM)*** | • Introduction to Developing need assessment and building Human capacity for BRM *During* Theory session<br>○ 1 contact hour required |
| | • Medicine Clinic-II ***(Incident Management and Response)*** | • Introduction/demo to the concepts of Incident Management and response *During* Practical session<br>○ 1 contact hour required |
| | • Theriogenology Clinic – II ***(Evaluate Human performance for BRM in Lab)*** | |

**Dairy Science Park – Sandia National Laboratories USA Collaboration**
**Pakistan's BRM Curriculum Development**
**DVM National Curriculum**

| | | |
|---|---|---|
| | • Beef and Mutton Production ***(Developing SOPs for food processing facilities)*** | • Human performance evaluation in BRM Lab *During* Theory and Practical<br>○ 1 contact hour required<br>• Developing biosafety SOPs for food processing facilities *During* Practical session<br>○ 1 contact hour required |
| **Semester 8:** | • Veterinary Epidemiology and Public Health ***(BRM principles used in Epidemiology and Public Health field)***<br>• Medicine Clinic III ***(Evaluating, measuring and improving overall BRM performance)*** | • Introduction to BRM principles used in Epidemiology and Public Health Field *During* Theory session<br>○ 1 contact hour required<br>• Evaluating, measuring and improving overall BRM performance in clinic settings based on available standards *During* Practical session<br>○ 1 contact hour required |
| **Semester 9:** | • Poultry Pathology (Lab design principles for implementation of BRM)<br>• Medicine Clinic-IV ***(Basic/Preliminary Administrative control for BRM)*** | • Basic introduction to the concepts of Lab design principles for implementation of BRM *During* Practical session<br>○ 2 contact hour required<br>• Basic/Preliminary introduction to the Administrative control for BRM *During* Clinics session<br>○ 1 contact hour required |
| **Semester 10:** | ***No integration*** | |

**Contact:**

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## Dairy Science Park - Sandia National Laboratories, USA
## Biorisk Management Workshops – List of Alumni

| SN | Delegate | Amsterdam Mar 2015 | Dubai May 2016 | Bangkok Nov 2016 | Phuket Mar 2017 | Colombo Sep 2017 | Konya Nov 2017 | Amman Apr 2018 | Dubai May 2019 | Tot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Muhammad Subhan Qureshi, UAP | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| 2 | Sar Zamin Khan, UAP | 1 | 1 | 1 | | | | | | 3 |
| 3 | Umer Sadique | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| 4 | Muhammad Imran | 1 | | | | | | | | 1 |
| 5 | Irfan ul Haq Qureshi | | 1 | 1 | 1 | 1 | 1 | | | 5 |
| 6 | Samina Naz Qureshi, DSP | | 1 | 1 | 1 | | | | | 3 |
| 7 | Nasir Shah, HEC/FATA Uni | | 1 | 1 | 1 | | | | | 3 |
| 8 | Shakoor Ahmad, UAP | | 1 | 1 | | | | | | 2 |
| 9 | Sadia Subhan Qureshi, ICU | | 1 | | | 1 | | | | 2 |
| 10 | Muhammad Rashid Aman, SMEDA | 1 | | | | | | | | 1 |
| 11 | Arif Yousaf, Spl Asst CM | | | 1 | 1 | 1 | 1 | | | 4 |
| 12 | ZiaUl Haq, KMU | | | 1 | 1 | | | | | 2 |
| 13 | Sher Bahadar Khan, UAP | | | 1 | | 1 | 1 | 1 | | 4 |
| 14 | Shoaib Sultan Afridi, UAP | | | 1 | | 1 | | | | 2 |
| 15 | Syed Muhammad Suhail, UAP | | | 1 | | | | | | 1 |
| 16 | Sania Subhan Qureshi, UAP | | | 1 | | | | | | 1 |
| 17 | Nighat Perveen, Dubai | | | 1 | | | | | | 1 |
| 18 | Muhammad Azam Kakar, BUITEMS/World Bank | | | | 1 | 1 | 1 | | | 3 |
| 19 | Farhan Anwar, UAP | | | | 1 | 1 | | 1 | | 3 |

1

| S No | Delegate | Amsterdam | Dubai | Bangkok | Phuket | Colombo | Konya | Amman | Dubai | Tot |
|---|---|---|---|---|---|---|---|---|---|---|
| 20 | Muzaffar Said, Finance Minister KP | | | | 1 | | | | | 1 |
| 21 | Naila Chand, UAP | | | | 1 | | | | | 1 |
| 22 | Shah Murad Khan, UAP | | | | 1 | | 1 | | | 2 |
| 23 | Murad Ali Wazir, UAP | | | | 1 | | | | | 1 |
| 24 | Rafi Ullah, UAP | | | | 1 | | | | | 1 |
| 25 | Arshad Zahoor , UAP | | | | 1 | | | | | 1 |
| 26 | Hamayun Khan, UAP | | | | | 1 | | | | 1 |
| 27 | Nighat Javaid, Farmer's Sausage Co. | | | | | 1 | | | | 1 |
| 28 | Ghazala Yasmeen, VC WUM | | | | | 1 | 1 | | | 2 |
| 29 | Muhammad Inam, SBBU Sheringal | | | | | 1 | | | | 1 |
| 30 | Nazir Ahmad, UAP | | | | | 1 | 1 | 1 | | 3 |
| 31 | Tayyab-ur-Rehman, KMU | | | | | 1 | 1 | | | 2 |
| 32 | Muhammad Arshad, PVMC | | | | | 1 | | | 1 | 2 |
| 33 | Rifatullah Khan UAP | | | | | | 1 | | | 1 |
| 34 | Samia Subhan Qureshi, UET | | | | | | 1 | | | 1 |
| 35 | Prof Masood Rabbani UVAS Lahore | | | | | 1 | | 1 | 1 | 3 |
| 36 | Prof Zafar Randhawa UAF | | | | | | | 1 | 1 | 2 |
| 37 | Dr Tariq UAF | | | | | | | 1 | | 1 |
| 38 | Dr Faqir Muhammad UAF | | | | | | | 1 | | 1 |
| 39 | Dr Kasib UAF | | | | | | | 1 | | 1 |
| 40 | Dr Shafia UAF | | | | | | | 1 | | 1 |

2

| S No | Delegate | Amsterdam | Dubai | Bangkok | Phuket | Colombo | Konya | Amman | Dubai | Tot |
|---|---|---|---|---|---|---|---|---|---|---|
| 41 | Dr. Ilahi Bakhsh Mastoi, PVMA, Quetta | | | | | | | | 1 | 1 |
| 42 | Dr. Muhammad Mubarak Jatoi, PVMA Sindh | | | | | | | | 1 | 1 |
| 43 | Dr. Nazeer Hussain Kalhoro, PRI, Karachi | | | | | | | | 1 | 1 |
| 44 | Dr. Sher Muhammad LDD Peshawar | | | | | | | | 1 | 1 |
| 45 | Dr. Ghulam Hussain Jaffar LDD Quetta | | | | | | | | 1 | 1 |
| 46 | Dr. Muhammad Iqbal Shahid LDD Lahore | | | | | | | | 1 | 1 |
| 47 | Prof. Dr. Zafar Iqbal Randhawa, UAF | | | | | | | | 1 | 1 |
| 48 | Prof. Dr. Abdul Latif Bhutto, SAU Tandojam | | | | | | | | 1 | 1 |
| 49 | Dr. Shakeeb Ullah Khan, GU, DI Khan | | | | | | | | 1 | 1 |
| 50 | Prof. Dr. Mumtaz Ahmed Khan, Riphah CVS, Lahore | | | | | | | | 1 | 1 |
| 51 | Muhammad Yasin Tipu Malik, UVAS, Lahore | | | | | | | | 1 | 1 |
| 52 | Dr. Mansoor Ahmed, DG LDD Lahore | | | | | | | | 1 | 1 |
| 53 | Prof. Dr. Arfan Yousaf PMASAU, Rawalpindi | | | | | | | | 1 | 1 |
| 54 | Prof. Dr. Masood Akhtar, BZU Multan | | | | | | | | 1 | 1 |
| 55 | Dr. Rasheed Ahmed Magsi, LDD Quetta | | | | | | | | 1 | 1 |

3

| S No | Delegate | Amsterdam | Dubai | Bangkok | Phuket | Colombo | Konya | Amman | Dubai | Tot |
|---|---|---|---|---|---|---|---|---|---|---|
| 56 | Lt. Col Dr. Aqil Hameed Ch (R), PVMC | | | | | | | | 1 | 1 |
| 57 | Maj Shaukat Yab Khan (R), PVMC | | | | | | | | 1 | 1 |
| 58 | Dr. Abdul Rehman, PRI Rawalpindi | | | | | | | | 1 | 1 |
| | **Total** | **5** | **8** | **14** | **15** | **17** | **12** | **11** | **23** | **105** |

**MISSED THE EVENTS:**

| | |
|---|---|
| 1 Zafar Hussain, Dairy Life | Dubai |
| 2 Asad Sultan, UAP | Dubai |
| 3 Inayatullah, Sr Minister LG | Dubai |
| 4 Mohib Ullah Khan, Spl Asst CM | Dubai |
| 5 Sher Muhammad, LDD | Dubai |
| 6 Kamran Akram Khan, Royal Dairies | Bangkok, Phuket |
| 7 Niaz Ahmad Naz, KPCCI | Phuket |
| 8 Muhammad Luqman, SDU | Phuket |
| 9 Khalid Khan, HED | Phuket |
| 10 Zahoor Ahmad Swati, VC UAP | Phuket |

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## c. Support of the Industry

Emerging industries in milk and meat processing and marketing have been provided technical and Quality Control certification support to relieve price capping and the so-called quality standardization threats from the District Administration. Meat shops are being established in the private sector on modern lines of hygiene with a sound level of investment. Such shops have to sell their products at relatively higher prices.

***i. Meat Shop, Jan Shopping Arcade***, Peshawar Cantt has been established by Mr Habib Jan as a model shop in Peshawar City. His facility was raided by the District Administration with the allegation that he is selling meat at higher prices. The DSP team visited his facility and inspected the quality of animals, slaughtering, processing, packaging and storage facilities. Jan Arcade had maintained quality of meat at their setup through procurement of the best and healthy animals of appropriate age, slaughtered and processed under hygienic and Islamic principles. The meat is graded as per accepted standards. Sufficient investment has been made in maintaining pathogens free environment and chilled storage. The Shop has gained consumers' confidence, attracting elite and quality conscious families across the City. Dairy Science Park has been providing technical support to the Jan Arcade and ensuring quality and Halal standards at their Meat Shop. The Minister Local Government has appreciated their meat quality during a presentation made by the Dairy Science Park and recommended its exemption from the general meat rates.

***ii. Farmers' Sausage Company***, Industrial Estate, Hayatabad, headed by Mrs Javed, requested the DSP for inspection after they were fined and banned by the District Administration from functioning. The facility has been working since 2003 with family investment; getting not interest-based loans from the financial institutions. High quality equipment was purchased for the factory and a quality control system was introduced. The products prepared at the factory were Baked Meatloafs, Mortadella, Smoked veal, Hunter sausages, Beef salami, Smoked chicken, Chicken pie, Chicken Sausages, Frankfurters, Pepperoni and Paprika. The inspection team were shown facilities by Mr

Bahram Khan, comprising premises for handling the incoming meat after arrival, cold room, weighing scale, mincing assembly, mixing and crushing machine, smoking chamber and boiling pots. The experts examined the quality of the facilities, discussed the deficiencies and advised the Company executives on improvement of the same. The Company's executives were educated upon the importance of hygienic practices and protocols in line with the national and international standards.

***Iii. The silage Production Facility Mardan*** was established by Khanzada Ahmed Kamal at Mardan. USAID Agribusiness Support Program provided him training and the equipment on subsidized rates. This facility has started producing silage on a preliminary pilot basis. Maize fodder is being used as the crop for production of silage. International Livestock Research Institute Kenya (ILRI) has been sponsoring Mr Nadir Khan, PhD Scholar Animal Nutrition to work on silage production using various maize varieties under local conditions. Romer Lab Rawalpindi has provided inoculums for the experiment. Mr Kamal and another registered farmer in Peshawar have agreed to provide land for the experiment.

***Iv. Royal Dairies*** has been established by Mr Kamran Khan, an Animal Husbandry Graduate and General Secretary of Dairy Science Park. Mr Khan established a dairy processing unit in the name of Royal Dairies. He has launched yoghurt and butter and got his products linked with the local superstores in Peshawar City. He has been linked with the Dairy Science Park in policy development, student entrepreneurship and interaction with the Corporate Partners.

***V. DSP Innovations*** has been established as a registered firm with the Ministry of Industries, Government of Khyber Pakhtunkhwa, to bring innovations in the existing farming system in the private sector. Silage was purchased from Punjab and introduced at the dairy and calf fattening facilities in Peshawar City. Meat Park was established at Peshawar and silage was introduced at the fattening farm owned by another partner of Meat Park which replaced the wheat straw, reduced production cost and improved the growth rate and health of calves. However, the partnership could not continue due to delayed/non-payment to the two investing partners in feed and silage.

***Vi. Peshawar Meat Company*** was established as a meat processing and packaging factory with labelled quality, traceability and shelf-life parameters. The facility was introduced as an entrepreneurship model and graduates were provided an opportunity to get access to practical learning. However, lack of availability of quality animals at appropriate age, competition of culled buffaloes with the prime meat produced by the factory, lack of appropriate investment for animal purchase and establishment of an exclusive sale point and unfriendly attitude of the superstores managers forced DSPI to close the operation.

***Vii. DSP Clinic and Marketing Center Chamkani*** was established to support the calf fattening facility, at GT Road, Peshawar. It was run by a part-time veterinary consultant DSP, Dr Muhammadullah who visited this and other farms in the premises and provided therapeutic and advisory services. DSP Innovations envisions, especially introduction of elite dairy and beef semen produced at CEBG facilities, into the local commercial farms. Good practices were introduced at the local farms, especially improved hygienic status through availability of plenty of clean water using solar water pumps and bio-waste management.

***Viii. Unemployed veterinary graduates***, about 1000 at provincial level, are being supported in career development by the Dairy Science Park. Small and Medium Enterprise Development is providing support to these young graduates in entrepreneurship development. Financial aid agencies, especially Meezan Bank and Apna Bank have agreed to facilitate entrepreneurs through Islamic Financing Packages. Medicine and Feed companies working in the province and corporate livestock and poultry farms in the province and commercial and government firms in the Middle East are facilitating these young graduates in getting jobs.

***Ix. Model Slaughter House and a Dairy Science Park Board*** was agreed by the provincial government of Khyber Palhtunkwa, allocating Rs.200 million for establishing a model slaughter house in consultation with the Park and has directed for establishment of to implement the idea in collaboration with Peshawar Development Authority. These facilities will provide processing and marketing backup to the local livestock and poultry farms and link them with the international market.

***X. Advocacy Forum – DSP (AF-DSP)*** has been established pursuant to recommendations of various committees and Board of Governors. The Forum is headed by Mr Arif Yousaf Ex MPA/Convener Task Force on Sustainable Development Goals of provincial assembly/Chief Patron DSP, assisted by Prof M Subhan Qureshi, President DSP.

Terms of Reference of Advocacy Forum Dairy Science Park have been notified. The Advocacy Forum would be hosted by Dairy Science Park and the Panels of Experts/local and international linkages would be provided to the Forum. Meetings of the Forum would be held on a quarterly basis. The issues faced by the milk and meat shops/processing factories, regarding price fixation and punishing/sealing of the facilities by government agencies, would be considered and a way out would be suggested for implementation of SOPs, quality control analysis/certification and category-based pricing. SOPs would be developed for implementation at milk and meat shops and processing facilities, protecting the environment and public health.

Sharia compliance of the food produced at these facilities and open market would be monitored. Legislation would be worked out through provincial and national assemblies, for protecting interests of the stakeholders and for boosting generation of decent employment and exportable surpluses across the food value chain. Establishment of an Endowment Fund for entrepreneurship development through seed money from the Government of Khyber Pakhtunkhwa and its enhancement through other sources. Assisting the public sector organizations in achieving their sectoral goals through participatory approaches.

## d. Kamran Khan - A Beacon of Hope


Mr. Kamran Khan, Chief Executive of Royal Dairies, is an Animal Husbandry graduate whose entrepreneurial journey reflects resilience, innovation, and an unwavering commitment to quality. Alongside his wife, a medical graduate, he has successfully transformed professional knowledge into a sustainable source of livelihood, setting a compelling example for young graduates aspiring to enter the livestock and food sectors.

Recognized by the Dairy Science Park (DSP) as a "Beacon of Hope," Mr. Khan represents a new generation of entrepreneurs who effectively bridge the gap between academia and industry. His efforts have not only ensured the economic stability of his family but have also contributed to the welfare of the farming community and the provision of safe, high-quality food to consumers in Peshawar.

Mr. Khan began his professional career by establishing a dairy farm, where he applied his academic training in a practical setting. He subsequently ventured into milk marketing; however, the prevailing regulatory framework—particularly uniform price controls imposed without due consideration of quality grading—undermined the viability of this initiative and compelled him to discontinue the business.

Undeterred by these setbacks, he diversified into quail breeding and fancy bird production in Badaber, a suburb of Peshawar. While the venture showed promise, it faced technical and infrastructural challenges, particularly the management of quail

during severe winter conditions and frequent electricity outages, which adversely affected operational efficiency. Drawing valuable lessons from these experiences, Mr. Khan established a dairy processing unit under the name Royal Dairies. This marked a strategic transition towards value addition, focusing on the production of quality dairy products such as yoghurt and butter. By maintaining high standards and developing linkages with local markets, Royal Dairies has earned the trust of quality-conscious consumers and established itself as a reliable brand in the city.

Mr. Khan's journey embodies the core philosophy of the Dairy Science Park—transforming knowledge into enterprise, adapting to challenges with resilience, and upholding quality as the foundation of consumer trust. His success story serves as a guiding model for veterinary and animal husbandry graduates, demonstrating that persistence, innovation, and technical competence can create sustainable livelihoods even in a challenging and evolving business environment.

"Entrepreneurship is not merely a profession—it is a pathway to dignity, resilience, and service to society."

The experience of entrepreneurs like Mr. Khan also highlights the broader structural challenges faced by the livestock and poultry sectors. Farmers often struggle to establish effective linkages with reliable service providers, particularly fair marketing channels. Animal health issues are frequently chronic in nature, exacerbated by poor-quality medicines, under-dosing of antibiotics, a predominantly therapeutic rather than preventive approach to veterinary care, inadequate housing and ventilation, and weak hygienic practices. The farm profitability and sustainability are compromised, leaving farmers in a constant state of uncertainty. Veterinary services are sought only during severe disease outbreaks or mortality events, a reactive approach commonly described as "fire brigade treatment." It often overlooks the hidden and cumulative losses arising from under- or overfeeding, toxic feed inputs, parasitic infestations, infertility, and other production constraints of economic importance. As a result, farmers remain unaware of the full extent of productivity losses within their systems.

In response to these challenges, the proposed Livestock Technopark Peshawar envisions a structured and proactive service delivery model. It aims to engage and train unemployed DVM graduates as well as in-service veterinarians to undertake regular farm visits, focusing on animal health, productivity, and early identification of hidden losses. Within this framework, veterinary professionals will function not only as animal health practitioners but also as public health guardians and facilitators of farm-level economic efficiency. This integrated approach will enable farmers to achieve higher productivity with optimal resource utilization, ensuring the production of milk, meat, and eggs that meet recognized quality standards through certified laboratory support. At the same time, graduates from engineering, medical, business, and other disciplines in natural and social sciences will be encouraged to establish complementary services, thereby strengthening the overall ecosystem of livestock production and value addition.

## e. Reshaping Academic Approaches

*Investigating sheep herd as an entrepreneurship model*

The teaching and research paradigm at the University of Agriculture Peshawar was strategically reshaped under the framework of the Dairy Science Park (DSP) to respond to the evolving challenges faced by farmers, agribusiness stakeholders, and consumers. This transformation aimed at aligning academic activities with field realities, thereby promoting problem-solving, innovation, and entrepreneurship within the livestock sector.

Under this initiative, the laboratory facilities of the Animal Health Department were effectively utilized for investigating disease problems in medium-sized livestock herds and poultry flocks. These facilities also supported the monitoring of hygienic standards across production, processing, and marketing systems for livestock products. In parallel, the University Veterinary Clinic was transformed into a semi-commercial, sustainable service unit operating through a revolving fund mechanism, providing veterinary medicines and services through an organized pharmacy system.

The Livestock Management Department expanded its role beyond conventional teaching to actively investigate the productivity, product quality, and business potential of sheep, goats, poultry, dairy, and beef animals. Studies focused on carcass yield and quality, meat processing, palatability, and consumer preferences, thereby linking production with market demand. Indigenous livestock and poultry breeds were evaluated for their productivity and potential for business incubation, while commercial farmers were engaged through technical support and the introduction of improved management practices.

The University Feed Mill, managed by the Animal Nutrition Department, was operated through a lease arrangement with a private sector partner. This initiative created an effective interface between academia and industry, enabling applied research and providing outreach services to medium-scale commercial farmers. Faculty members

and postgraduate students utilized this platform to conduct field-oriented research, while continuous feedback from farmers helped refine products and practices. Efforts were also directed toward exploring alternative feed resources and developing technologies to enhance feed efficiency in livestock/poultry. Feasibility models for entrepreneurship in meat production were developed based on field data/market analysis.

A significant outcome of this academic restructuring was the development of entrepreneurship models through postgraduate research, particularly within the Poultry Science Department. Research on quail production under a revolving fund system generated valuable insights into feed conversion efficiency, antioxidant supplementation, growth performance, breeding efficiency, and the effects of aflatoxins on economic and physiological parameters. It was observed that aflatoxin B1 induces clinical and biochemical alterations in different organs when administered at varying concentrations. Studies on the use of organic acids demonstrated a significant improvement in net returns, highlighting their economic potential.

Further investigations into artificial insemination techniques in Japanese quails showed promising results, with reduced fertility-related issues compared to natural mating. The use of proctodeal gland foam as an extender proved effective in improving fertility, hatchability, sperm motility, and overall reproductive efficiency, while also being cost-effective in terms of production per chick. The economic feasibility of quail farming, based on experimental data, demonstrated that a revolving fund of Rs. 400,000 could generate a monthly income of approximately Rs. 42,000, presenting a viable entrepreneurship model for the region.

Similarly, rabbit farming was evaluated under an ALP-PARC project. The findings indicated considerable potential for rabbits as an alternative source of meat production. Based on accumulated data, a feasibility model was developed, showing that an investment of Rs. 200,000 could generate a monthly income of approximately Rs. 41,325 through the management of 500 rabbits.

*The Chairman HEC Islamabad acknowledged DSP as an Academia-Industry Model*

## f. Institutional Collaboration

***DSP/UAP/UVAS/UAF and Mevlana Exchange Program Turkey***

Dairy Science Park (DSP) has actively pursued institutional collaborations at national and international levels to strengthen academia–industry linkages and promote sustainable development through livestock-based entrepreneurship. A significant milestone in this regard was the signing of Memoranda of Understanding (MoUs) with Selçuk University, Konya, Turkey, and the Mevlana Exchange Program during DSP III in 2015 at Peshawar. The Turkish delegation was led by Dr. Mithat Direk, while the Pakistani side included Mr. Arif Yousaf, Special Assistant to the Chief Minister Khyber Pakhtunkhwa on Law, Prof. Zahoor Swati, Vice Chancellor of the University of Agriculture Peshawar (UAP), and Prof. Dr. M. Subhan Qureshi, Dean FAHVS. The ceremony was also attended by key stakeholders from academia, government, and industry, reflecting a shared commitment to collaborative progress.

Under the Mevlana Exchange Program, both sides agreed to promote academic and student exchanges in line with the program's guiding principles, with the objective of addressing challenges identified through DSP initiatives. The collaboration with Selçuk University focuses on developing self-employment models, promoting hygienic food production, and advancing joint research in livestock and poultry health and production systems. These efforts are aimed at reducing production costs, improving disease control, and facilitating market access for products from both regions.

Parallel MoUs were also signed with the University of Veterinary and Animal Sciences (UVAS) Lahore, the University of Agriculture Faisalabad (UAF), and Pir Mehr Ali Shah Arid Agriculture University Rawalpindi. These institutions effectively utilized the opportunities provided under the Mevlana Program, enabling numerous students and faculty members to benefit from short- and long-term training programs. While the University of Agriculture Peshawar initially lagged in leveraging this collaboration, subsequent efforts—particularly by Dr. Umer Sadiq—resulted in facilitating visits of

around forty faculty members and postgraduate students to Turkey. This engagement also paved the way for meaningful industrial collaboration between private sector stakeholders in both countries.

***DSP, KMU, UAP and HEC Collaboration in BRM***

A landmark collaboration in public health and biosafety was established through the Collaborative Biorisk Management Initiative (CBMI), formalized via an MoU between DSP, Khyber Medical University (KMU), UAP, and the Higher Education Commission (HEC) of Pakistan. Supervised by the Chairman HEC, Prof. Mukhtar Ahmed, this initiative emerged as a follow-up to an international consultative workshop held in Bangkok. The CBMI focuses on integrating biorisk management concepts into academic curricula, developing new courses, and strengthening institutional capacity to address emerging biological risks. Faculty from KMU actively contributed to curriculum development, and these concepts have since been incorporated into postgraduate programs, particularly within public health disciplines.

***Women University Mardan and SBBU Sheringal***

Expanding its outreach to women's empowerment, DSP signed an MoU with Women University Mardan (WUM) to promote "Biorisk Management and Women Entrepreneurship (BMWE)." This collaboration emphasizes evaluating biorisk factors across the livestock value chain while simultaneously fostering entrepreneurship among educated women. By linking applied research with business incubation, the initiative supports self-employment and hygienic food production, aligning with the United Nations Sustainable Development Goals under #SDGAction9671. It also aims to safeguard public health by developing standards, guidelines, and interdisciplinary linkages in biorisk management, while empowering women to establish livestock-based enterprises.

Further strengthening regional collaboration, DSP partnered with Shaheed Benazir Bhutto University (SBBU) Sheringal under the framework of "Transforming Farm Resources into Entrepreneurship (TFRE)." This initiative focuses on utilizing indigenous resources and evaluating livestock-based food value chains for enterprise development. The collaboration promotes halal food standards, traceability, and public health safety while facilitating training, applied research, and startup development for graduates. Close coordination with ORIC offices ensures effective translation of research into field applications, supported by stakeholder consultations and advocacy platforms.

***Sindh Universities***

In Sindh, DSP established collaboration with the University of Sindh Jamshoro through another CBMI-focused MoU, aiming to address biorisk factors across livestock, poultry, and fisheries sectors. This partnership integrates public health, environmental safety, and entrepreneurship development, with a strong emphasis on curriculum development, research, and capacity building. The initiative aspires to position the University of Sindh as a leading center for biorisk management while strengthening academia–industry linkages and supporting halal food production for both local and export markets. Engagements with newly established institutions such as Shaheed Benazir Bhutto University of Veterinary and Animal Sciences (SBBUVAS) Sakrand and Sindh Agricultural University Tandojam further expanded DSP's collaborative footprint.

These interactions included academic exchanges, specialized training workshops, and knowledge-sharing sessions on advanced topics such as bovine reproduction and artificial insemination. International experts contributed to these programs, enhancing technical capacity and practical skills among students, professionals, and farmers.

***CEBGE, RVFC, Pakistan Army***

DSP also initiated collaboration with the Center of Excellence on Bovine Genetics (CEBG) of Remount Veterinary and Farms Corps (RVFC) of Pakistan Army, to facilitate access to high-quality genetic resources, including elite semen and embryos. This partnership aims to improve livestock productivity through advanced breeding technologies while supporting farmers and veterinary practitioners with training and technical services.

***Chinese Academy of Science***

At the international level, a Letter of Intent was signed with the Chinese Academy of Agricultural Sciences to launch the Economic Collaboration through Livestock Commercialization (ECLC) initiative in the Pak-Afghan region. This strategic partnership focuses on capacity building, applied research, and enterprise development to enhance livelihoods. By engaging stakeholders across the value chain—including farmers, veterinarians, and small enterprises—the initiative seeks to promote quality production of milk, meat, and eggs in line with national and international standards. Support mechanisms such as endowment funds and common facility centers are envisioned to facilitate entrepreneurship, with implementation support from organizations like the KP Chamber of Commerce and Industry and SMEDA. Overall, these institutional collaborations reflect DSP's integrated approach to addressing regional challenges through knowledge exchange, capacity development, and sustainable entrepreneurship, ultimately contributing to food security, public health, and economic resilience.

*DSP-CEBG Collaboration in Reproductive Biotechnologies*

## g. GreenWend Energy, SunSaviour and Env Protection


A biogas generating system has been introduced at medium-sized farms in the province. A review study was supported, directed at establishment of a commercial biogas sector for electric power generation. Keeping in view Pakistan's agriculture base and environmental concerns, we focus on the biogas sector for electric power generation. Biogas can act as an alternative, sustainable, and renewable energy resource. Our analysis illustrated that there is a pronounced potential for the commercial biogas sector for mitigating the energy crisis in Pakistan.

Solar energy has been found in abundance in the region and training programs were organized to introduce biogas and solar energy for farm operations. The outgoing graduates have been motivated to introduce the technology as a tool for sustainable development in the field. Installation of two biogas backed electricity generation units was facilitated at the University of Agriculture, Peshawar and COMSATS University, Abbottabad as demo models for replication and training of stakeholders.

GreenWend has been launched as a startup company under the umbrella of the Dairy Science Park, with the mission: "Now is the time to make your own energy. Avoid the rising energy costs and enjoy peace of mind with GreenWend!. The company deals with Solar System designing, Installation and Maintenance for Your Homes, business places and agriculture sectors. This company was founded to reduce the energy crisis in Pakistan and bring the people towards green energy. We are providing designing, installation and maintenance services of solar energy in Pakistan.

Our goals are: i) Decreasing electricity bills; ii) Decreasing load on public sector

power operations; iii) Skill development of youth for decent employment; iv) Business incubation of salable research; v) Assisting Dairy Science Park in implementing SDGs 2, 3, 4 and 8, covering zero hunger, good health and well being, women empowerment, decent employment and adding SDGs 7, 9 and 13, covering affordable and clean energy, industry innovation and infrastructure and climate action.

Our products are: Solar Panels, Inverters, Batteries installation with a one year free maintenance warranty; Domestic packages of solar systems with the capacity of 1 KW, 2 KW, 3 KW, 5 KW, 7 KW and 10 KW; Remote solar monitoring; Innovations in solar technologies. We are categorized as: Solar Energy Company; Solar Energy Service; Electric Utility Provider; Skill Development Training; Artificial Intelligence in Solar Systems; Business Incubation; Agricultural operations

Our interventions in renewable energy and environment protection commenced with the graduation in Electrical Engineering, of the founders of GreenWend Energy Private Limited Peshawar, Engr Zeeshan Saeed Shah, Engr Samia Subhan Qureshi and Engr Saad Rashid from the University of Engineering and Technology (UET), Peshawar. They got Masters from USPCAS-E and were part of the last cohort of USPCAS-E exchange scholars to visit the U.S. They continued research work at the Photovoltaic Reliability Laboratory of Arizona State University (PRL-ASU).

Engr Samia was described as a startup founded by the Arizona State University, USA ( Sano 2019 ). When asked to describe the importance of her research, she suggested that by eliminating the use of pyranometers, pyrheliometers and two-axis trackers for an outdoor angle of incidence (AOI) measurement, their proposed model offers a cost-effective outdoor AOI measurement. She helped Engr Zeeshan, her husband, in conceptualising and establishing GreenWend Company as a private company. Her success story was presented at a high-level meeting between the Government of Khyber Pakhtunkhwa and USAID, chaired by Mr Donald Blome, the U.S. Ambassador to Pakistan on April 11, 2022.

Engr Zeeshan, after graduating from UET Peshawar, desired to establish his own business setup rather than joining some government organisation for a job, as per practice of the youth in the country. He went through prolonged consultation and feasibility studies and joined a local company to evaluate the prevailing practices in the market. He invited his colleagues to establish a solar energy company for providing services to the residential and commercial clients. GreenWend Energy Pvt Ltd Peshawar was registered as a company under a partnership deed with GoKP, PEC and SECP.

R&D Team of GWE, headed by Engr Saad Rashid, designed an inverter, green energy metres and lithium ion batteries, produced in Chinese factories and marketed in various cities with the name SunSaviour. Technical cooperation with German and US Universities and Companies was established by Irfan ul Haq Qureshi, Strategic Planner GWE. Various commercial companies, Universities and R&D Organizations were engaged under the ISE2024 for interaction through stalls, panel discussions, and poster presentations.

ISE2024, an International Solar Expo and Conference was held at Peshawar in collaboration with partners from Academia, Industry and Government. It facilitated

various stakeholders for interaction and finding solutions for the issues they are facing. Policy Recommendations were prepared for overcoming the energy crises, unemployment issues, environmental threats and the increasing import bills of the government. SunSaviour and GreenWend Energy have been working as startups, under the Dairy Science Park umbrella. They have successfully:

i. installed 15 megawatts (MW) of solar energy capacity, resulting in a reduction of approximately 24,638 metric tons of $CO_2$ emissions.

ii. This clean energy generation is equivalent to: i) 49 million kilowatt-hours (kWh) of renewable electricity; ii) Avoiding 24,638 tonnes of $CO_2$, and;

iii) The carbon sequestration of 1.1 million trees.

The SunSaviour Lithium-Ion Batteries were introduced in Pakistan, which are different to do more than just store energy. These batteries are engineered with a 15-year design life, built specifically for Pakistan's fluctuating grid conditions, and optimized to perform seamlessly with any solar panel, hybrid solar inverter, or solar power installation. SunSaviour launched the SunSaviour Care App, a smart, customer-focused digital platform designed to simplify after-sales support and enhance the overall solar ownership experience. The users can access product information, technical support, and service updates directly from their smartphones, anytime.

SunSaviour launched its Customer Care Centers across 28 major cities in Pakistan, bringing their commitment to excellence in service closer to their valued customers. From the northern valleys of Dir, Swat, and Buner to the bustling urban hubs of Karachi, Lahore, and Islamabad, our centers are designed to ensure every SunSaviour customer receives timely support, expert guidance, and hassle-free service.


*Celebrating the milestone*

## h. National Eco-Security System (NESS)

Dairy Science Park (DSP) has played a pivotal role in integrating climate resilience and eco-security into the livestock sector through resource-efficient practices, clean energy adoption, institutional reforms, and nature-based solutions. The actions may be reviewed as follows:

*Sustainable Livestock Practices:* Improved livestock production and processing models have minimized the risks of contaminating the food chain, water sources, and air, while simultaneously enhancing farm productivity and product quality, including:

- Low-input farming models for quail, rabbit, and poultry.
- On-farm waste recycling into organic fertilizer.
- Reduced reliance on synthetic inputs and external feed resources.
- Climate-resilient livestock models, using locally adapted breeds resistant to drought and disease.
- Sustained rural incomes and resilience to climate variability through the replication of over 1,000 startup models in diverse agro-ecological zones.

These integrated solutions have not only conserved resources but also stimulated entrepreneurship and decent employment among rural communities.

*Renewable Energy Integration:* Clean energy adoption was institutionalized through the establishment of GreenWend Energy Pvt Ltd and SunSaviour, both dedicated to scaling solar-powered solutions for residential accommodations, commercial applications, agriculture and rural livelihoods. Key achievements include: i) Promotion of decentralized solar energy systems in off-grid regions and ii) Organization of the International Solar Expo 2024, which significantly accelerated rural solar awareness and adoption across northern Pakistan.

*Biorisk Management and Climate-Smart Research:* DSP collaborated with academic partners to embed biorisk management and sustainable lab practices into university curricula. This initiative: i) Promoted safe laboratory environments and climate-conscious research culture; ii) Engaged over 500 scholars in applied research linked to animal health, food safety, and environmental resilience.

*National Eco-Security System Pakistan:* DSP launched the National Eco-Security System of Pakistan (NESS-Pak) to institutionalize environmental conservation across academic and research institutions. Achievements include:

- Engagement of 347 institutions across Pakistan and abroad, with 82 (23.6%) providing institutional support, 66 (19.0%) offering individual pledges, and 199

(57.3%) pending engagement.

- A network of 526 registered supporters contributing to eco-security initiatives.
- Active conservation of protected areas, including Khunjerab National Park, which has been linked with the International Alliance of Protected Areas to support responsible ecotourism and reduce overgrazing.
- The Ministry of Science and Technology (MOST) is now considering the formal establishment of a National Eco-Security Commission of Pakistan, building on DSP's groundwork and policy advocacy.

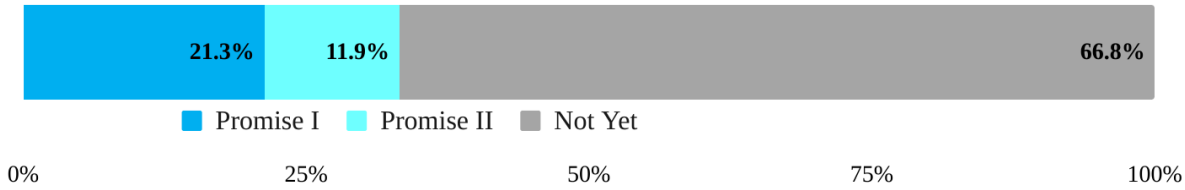
**NESS Academic Community of Pakistan - 1. Academia + Research**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 |
| 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 |
| 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 |
| 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 |
| 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 |
| 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 |
| 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 |
| 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 |
| 154 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 |
| 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 |
| 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 |
| 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 |
| 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 |
| 239 | 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 |
| 256 | 257 | 258 | 259 | 260 | 261 | 262 | 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270 | 271 | 272 |
| 273 | 274 | 275 | 276 | 277 | 278 | 279 | 280 | 281 | 282 | 283 | 284 | 285 | 286 | 287 | 288 | 289 |
| 290 | 291 | 292 | 293 | 294 | 295 | 296 | 297 | 298 | 299 | 300 | 301 | 302 | 303 | 304 | 305 | 306 |
| 307 | 308 | 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 | 318 | 319 | 320 | 321 | 322 | 323 |
| 324 | 325 | 326 | 327 | 328 | 329 | 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 | 338 | 339 | 340 |
| 341 | 342 | 343 | 344 | 345 | 346 | 347 | 348 | 349 | 350 | 351 | 352 | 353 | 354 | 355 | 356 | 357 |
| 358 | 359 | 360 | 361 | 362 | 363 | 364 | 365 | 366 | 367 | 368 | 369 | 370 | 371 | 372 | 373 | 374 |
| 375 | 376 | 377 | 378 | 379 | 380 | 381 | 382 | 383 | 384 | 385 | 386 | 387 | 388 | 389 | 390 | 391 |
| 392 | 393 | 394 | 395 | 396 | 397 | 398 | 399 | 400 | 401 | 402 | 403 | 404 | 405 | 406 | | |

**NESS Academic Community of Pakistan - 2. Government + Others inland**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 |
| 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 |
| 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 |
| 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 |
| 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | | | | | |

**Progress**




***Summary of Support from HERIs and other organizations***

| | | |
|---|---|---|
| Pakistan: Area[1] | | 881,912 km² |
| Population[2] (by the end of 2024) | | 251,269,164 |
| Population[2] (by the end of 2080) | | 479,745,112 |
| Population[2] (by the end of 2100) | | 511,000,619 |
| Population proportion of Children under 15 year-old[3] (by the end of 2022) | | 36.57% |
| Higher Education Institutions | Total number | 359 |
| | No. of Promise I | 49 |
| | No. of Promise II | 13 |
| | % of (I+II)/Total | 17.27% |
| Research Institutes | Total number | 47 |
| | No. of Promise I | 6 |
| | No. of Promise II | 4 |
| | % of (I+II)/Total | 21.28% |
| Other organizations | No. of Promise I | 42 |
| | No. of Promise II | 28 |
| Number of organizations who have experts and scholars making promise | | 167 |
| Number of individuals who made promise | | 660 |

The status of organizations is divided into the following 3 categories:

| |
|---|
| **Promiser I**, dark blue, promises made by organizations |
| **Promiser II**, light blue, promises made by individuals |
| "**Not yet**," grey, no promiser yet |

The organizations are first listed by "Promiser I," "Promiser II," and "Not Yet." Within these categories, they are further sorted by progress on NESS and, finally, in chronological order of when promises were made. The "Not Yet" organizations are listed in random order.

1

2

3

There are **503** higher education, research, Government and other institutions (HERIs) affiliated with NESS Pakistan, out of which 107 (21.3%), 60 (11.9%) and 336 (66.8%) have made institutional, individual and no promises yet, respectively. As of April 2026, the number of members of the Editorial Committee has been: 126 Editorial Committee (EC) members for Pakistan Volume of NESS Global Report, as well as 15 Youth Editorial Committee (YEC) members were identified, with 3 executive members totaling 144 from various HERIs. A total of 660 persons have got registered as NESS Supporters through NESS-Pak.

An EC/YEC is composed of one expert/young scholar from each higher education and research institution. Each EC member, with the assistance of a YEC member, is responsible for documenting the support and participation of their organization in the *NESS Initiative*.

***Chronicle of Major Events***

This section documents events that influence the advancement of NESS at the national level. The entries are formatted as "Date, Persons, Location, Event, Impact" and are arranged in chronological order.

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1. On November 18-19, 2022, Mr. Muhammad Shahid Iqbal and Ijaz Khan, Pakistan PhD. Students at Hainan Normal University, attended the first NESS Congress and launched the Haikou Initiative together with other 202 participants from 26 countries.
2. On January 17, 2023, Prof. Subhan Qureshi, President, Dairy Science Park; Professor, Khyber Pakhtunkhwa Agricultural University, became a supporter of *Haikou Initiative*.
3. On February 20, 2023, Mr. Muhammad Shahid Iqbal visited NESS ISN office in University Science Park of Hainan Normal University together with his supervisor Prof. Hong Meilin and Prof. Lin Liu. Prof. Hong initiated the preparation of ESSAP Forum of International Students with Mr. Muhammad Shahid Iqbal's assistance.
4. On October 13, 2023, Mr. Tian Dexin, Dr. Xie Yan had the first online meeting with Prof M Subhan Qureshi and Dr. Sher Bahadar Khan to discuss working in Pakistan.
5. On October 13, 2023, NESS Pakistan: https://dairysciencepark.org/ness/ became available and the Preparatory Committee NESS-Pak was established.
6. On October 27~30, 2023, Prof. Subhan Qureshi attended the 2023 NESS Congress online and delivered the presentation of "Our responsibility to protect the future of our kids on the Planet Earth".
7. On October 27~30, 2023, Mr. Muhammad Shahid Iqbal attended the 2023 NESS Congress, and was in charge of communication with International Students in Hainan Normal University and Hainan Medical University. Co-Chaired the ESSAP Forum of International Students.
8. On November 10, 2023, Prof M Subhan Qureshi received an ICP certificate.
9. On November 14, 2023, Prof M Subhan Qureshi prepared the Pakistan Initiative.
10. On December 6-8, 2023, the IRAD AWKUM Conference was held online. NESS-Pak was represented at the Conference with the theme RECENT TRENDS IN IMPROVING

RESISTANCE AGAINST DISEASES USING MOLECULAR GENETICS AND OMICS TOOLS.Prof Dr Muhammad Subhan Qureshi, President NESS-Pak presented his paper on "Integrated approach for maintaining eco-security in Pakistan under NESS-PAK" and Mr. Tian Dexin, Founder and Chief Scientist NESS International Science Network, Beijing made a presentation on "Jointly build an assured future of Eco-Security system for all children". In the Concluding Session, Recommendation of IRAD AWKUM Conference on Eco-Security were presented as follows:

a) National Research Center for National Eco-Security System Pakistan (NRC-NESS-Pak) will be established at AWKUM Mardan.

b) IRAD AWKUM Conference papers will be shared with NESS for their international database.

c) The 2024 International NESS Conference will be held at AWKUM in cooperation with NESS-ISN Beijing.

d) The Preparatory Committee NESS-Pak will hold National Workshops in coordination with HEC/PSF and other sponsors for issues identification and strategy development to respond to the issues.

11. On January 7, 2024, Prof M Subhan Qureshi sent the first list of supporters (18 people, 5 institutions).

12. On 1 March, 4 Institutional Representatives were notified for various organizations.

13. On 14 March, 203 persons and 98 institutions were notified as NESS Supporters on the NESS-Pak website.

14. On 21 March, the National Eco-Security Center was proposed for AWKUM, as a draft document by Prof Sher Bahadar Khan, Principal CVS, AWKUM/Secretary NESS-Pak. The same was evaluated by Prof M Subhan Qureshi, President DSP/President NESS-Pak and the objectives were updated as:

i. Engage national experts and institutions from subsectors of National Eco-Security System Pakistan (NESS-Pak), comprising Environment Security, Biological Diversity, Food Security, Public Health and Livelihood Security for analyzing the challenges and developing policy guidelines.

ii. Conduct interdisciplinary research to understand the drivers of Eco-Security and the threats to Six of the nine planetary boundaries, transgressed up to 2023 (Qureshi 2023) and to develop mitigation strategy.

iii. Develop innovative strategies and technologies for biodiversity monitoring, conservation, and restoration and engage/empower the local communities, conservation/development practitioners, and policymakers through local and international cooperation.

iv. To raise public awareness regarding the threats and spread of infectious diseases through biorisk management practices and organize a biennial series of national and international conferences on eco-security.

v. Integrate eco-security concerns into the national curriculum of biological sciences and launching postgraduate degree programs/undergraduate courses.

15. On 27 to 30 May NESS Congress 2024 was held at Shennongjia National Park, Hubei Province, China from, attended by Prof M Subhan Quresh and Prof Sher Bahadar Khan. The Progress Report for Pakistan was presented by Prof Qureshi at the Inaugural Session and a paper on invasive livestock species was presented at the Species Forum. Both Prof Qureshi and Prof Khan attended various sessions of the Congress.

16. On June 15-18, 2024C Changbaishan Conference on Sustainable Development of Global Geoparks & World Biosphere Reserves was held online with the Conference theme, Sustainable development of World Geoparks/World Biosphere Reserves. The event was cosponsored by the International Alliance of Protected Areas (IAPA / ISZS). Prof M Subhan Qureshi presented Khunjerab National Park, Gilgit-Baltistan, Pakistan as an invited paper.

17. On 23 July 2024 Record Note of an online meeting was issued covering Progress Report of NESS-Pak, which was presented by Prof. Qureshi, President NESS-Pak during the 2024 NESS Congress at Shennongjia; also attended by Prof Sher Bahadar Khan, Secretary NESS-Pak. It was agreed that the Pakistan Volume of NESS Global Report 2024 will be compiled into regional volumes and published after a few months. These reports will be shared with the heads of the respective governments, who will be expected to pay attention to the contents.

18. On 22 August Record Note was issued for a meeting covering a discussion on the country specific affairs. Efforts will be made to engage all relevant educational, research and development organizations in Pakistan, with the NESS-Pak. The recent core task of the NESS IEC member for Pakistan is to establish the Editorial Committee for the Pakistan Volume.

19. On 7-8 November 2024, the Second One Health Congress was held. with the Theme: One Targe, Long Term Survival of Human Being through National Eco-Security System. The NESS was highlighted as a crucial international scientific initiative aimed at safeguarding future generations. Prof. M. Subhan Qureshi presented the NESS Global Report Pakistan Volume, underscoring the 135 institutions that have committed to the NESS-Pak Initiative. A total of 512 individuals have also joined as supporters, signaling a growing commitment within Pakistan. A meeting of the Editorial Committee NESS-Pak was held. It was recommended that the Federal Ministry for Science and Technology, Islamabad will be approached for:

    - Approval for Dr. Muhammad Israr, PSO (NSLP), Pakistan Science Foundation, Islamabad, to serve as the Focal Point for NESS-Pak on behalf of the Government of Pakistan.
    - Allocation of time for a presentation on the NESS Global Report 2024 Pakistan Volume and submission of the report to the Prime Minister of Pakistan, as desired by Mr. Tian Dexin, Founder, NESS-ISN, Beijing.
    - To strengthen Pakistan's engagement with NESS-Pak, it is proposed to establish a National Eco-Security Commission Pakistan. This Commission would facilitate coordination across government ministries and focus on five key pillars of Eco-Security: i) Environmental Security; ii) Biological Diversity; iii) Food Security; iv) Public Health Security; vi) Livelihood Security.

20. On 7 March 2025 an online meeting was held between representatives of NESS-Pak and NESS-ISN in which various aspects of the establishment of the National Eco-Security

Commission of Pakistan (NESC), were discussed. Mr. Tian desired that the NESC proposal may be considered under the Pakistan China International Cooperation Program. In addition, all the participating HERI and other organizations may be included as members of the General Body of NESC. The NESS Research Center has already been established at AWKUM, which may be supported through the NESC.

21. On 17 April 2025 a meeting was held among the NESS-ISN with regional members including NESS Pakistan to discuss fellowship programs offered by the Chinese Academy of Science (CAS) and Alliance of International Science Organizations (ANSO). The opportunities were explained by Mr. Tian Dexin and Dr Yan.

***Salient Achievements***

| | |
|---|---|
|  |  |
| University Feed Mill functionalized under public private partnership as a Triple-Helix Good Governance Model | Quails farming was evaluated as an entrepreneurship model for generating decent employment and exportable surpluses |

*Attended 2024 NESS Congress at Shennonjia China*

## i. Diversity, Inclusion, Equity


Our solution actively promotes diversity, inclusion, and equity across geographic, gender, and socioeconomic lines. Through Dairy Science Park (DSP) and NESS-Pak, we have empowered marginalized livestock farmers, women entrepreneurs, and youth in underserved regions of Khyber Pakhtunkhwa and Northern Pakistan and Balochistan.

Our programs have achieved the goals as follows:

- *Gender Equality:* Over 35% of beneficiaries in training and entrepreneurship programs are women. We have supported female-led livestock and dairy businesses, providing access to technical training, credit facilitation, and market linkages.
- *Geographic Diversity:* Our initiatives reach remote and conflict-affected regions, including tribal districts and the Northern Areas, ensuring that economic and environmental benefits extend beyond urban centers.
- *Youth Empowerment:* By engaging veterinary interns, young researchers, and graduates in hands-on training, innovation hubs, and business incubation under DSP and NESS-Pak, we have created decent employment opportunities for the next generation of rural leaders.
- *Inclusive Governance:* Our Triple Helix Model (Academia–Industry–Government) ensures stakeholder representation from all segments of society in planning and decision-making processes.
- *Eco-Tourism and Indigenous Culture:* Under NESS-Pak, we are integrating indigenous knowledge and cultural heritage into ecotourism development, especially in Khunjerab National Park, providing livelihoods to local communities and preserving traditional wisdom. This inclusive approach has not only improved livelihoods but also strengthened community resilience, social cohesion, and environmental stewardship across socioeconomically disadvantaged populations.

## j. UN-SDG Action 40154

Dairy Science Park has been accepted by the United Nations as SDG Action 40154. The initiative contributes to sustainable development through improved governance of the livestock sector, strengthening food systems, and promoting inclusive economic opportunities across the livestock value chain.

Good Governance (SDG 2 – Zero Hunger)

Producing more with fewer resources, while balancing consumption and reducing losses, is a key objective for sustainable livestock production. According to the Food and Agriculture Organization (FAO, 2018), livestock supply chains are resource-intensive, requiring large amounts of land, water, nutrients, and energy while also contributing significantly to greenhouse gas emissions.

With global demand for animal products expected to increase, the livestock sector must produce more with less through improved governance and efficient value chains. Unsustainable production and consumption patterns lead to inefficient resource use, environmental degradation, lost economic opportunities, poverty, and health challenges.

Dairy Science Park addresses these challenges through the proposed Livestock Technopark Peshawar, which promotes sustainable livestock production, improved marketing linkages, and efficient value chains to strengthen livestock-based food security, contributing to SDG 2 (Zero Hunger).

Food Safety and Public Health (SDG 3 – Good Health and Well-Being)

Livestock provides essential food products such as milk, meat, and eggs, which must be produced and handled safely. Approximately 70% of emerging human diseases originate from animals, highlighting the importance of effective biosecurity and food safety systems.

A long-term initiative in biorisk management (BRM) has been implemented through Dairy Science Park and the Veterinary Research Institute at the University of Agriculture Peshawar. Under sponsorship from Sandia National Laboratories (USA), a wide range of stakeholders—including students, university faculty, researchers, provincial ministers, government officers, and industry representatives—have received international training.

This initiative will continue through the proposed Biorisk Management Center under the Livestock Technopark framework in collaboration with Khyber Medical University, expanding training and capacity building across the food value chain. These activities directly support SDG 3 (Good Health and Well-Being).

Women Empowerment (SDG 5 – Gender Equality)

Women play a vital role in the livestock value chain, particularly in animal husbandry, milk handling, food processing, and household food security. However, they often face limited income opportunities and higher exposure to food-borne and zoonotic diseases.

Women University Mardan has been actively engaged in Dairy Science Park activities. The Vice Chancellor and faculty members participated in international workshops on biorisk management and food safety, including curriculum development programs in Colombo, Sri Lanka, and the Dairy Science Park IV conference held in Konya.

Through collaboration with academic institutions and industry partners, Dairy Science Park promotes women's participation in entrepreneurship, livestock farming, food processing, quality control, and marketing services. These initiatives contribute to women's economic empowerment and professional development, in line with SDG 5 (Gender Equality).

Good Practices and Clean Energy (SDG 7 – Affordable and Clean Energy)

Adoption of best management practices in livestock production can significantly improve the efficiency of natural resource use while reducing environmental impacts. Sustainable feeding strategies, improved supply chains, and balanced consumption patterns can help reduce pressure on land, water, and energy resources, while lowering greenhouse gas emissions.

Further improvements can be achieved by reducing food waste and losses across supply chains and by promoting responsible consumption patterns. Achieving these goals requires collaboration among consumers, policymakers, researchers, industry representatives, and entrepreneurs.

In addition to promoting sustainable livestock production practices, Dairy Science Park has supported renewable energy innovation through its startup solar enterprise SunSaviour. The company has contributed to the development and promotion of solar energy technologies in the region through: i) Research and development of solar inverters and lithium-ion battery systems; ii) Design and provision of solar installation packages for residential and commercial users; iii) Introduction of innovative solar energy products to the local market; iv) Promotion of renewable energy awareness and entrepreneurship.

As part of these initiatives, Dairy Science Park organized the First International Solar Expo 2024 in Peshawar, bringing together researchers, entrepreneurs, industry representatives, and policymakers to promote renewable energy solutions for sustainable development.

Through these activities, Dairy Science Park supports the transition toward clean and affordable energy systems, contributing to SDG 7 (Affordable and Clean Energy) while strengthening sustainable economic opportunities across the food and energy value chains.

Employment Generation (SDG 8 – Decent Work and Economic Growth)

The province of Khyber Pakhtunkhwa, including the merged tribal districts, is rich in natural resources, particularly livestock. The livestock sector remains one of the primary sources of rural livelihood. However, most livestock farming in the province is subsistence-based, with households typically keeping 1–4 animals, which together represent more than 70% of the livestock population. Only a small proportion of animals are raised in commercial farms, limiting productivity, income generation, and value addition.

Agriculture and livestock activities—including farming, processing, marketing, and services—employ a significant portion of the labor force, while a large share of the rural

population relies on this sector for household income. Despite this potential, the younger generation often faces difficulties in finding sustainable employment opportunities within the sector. Through the initiatives of Dairy Science Park, efforts have been made to motivate postgraduate scholars and graduating university students to develop entrepreneurship models based on applied research and innovation. These initiatives encourage young professionals to establish enterprises in livestock farming, food processing, biotechnology products, and service delivery systems.

DSP promotes entrepreneurship through: i) Applied research and innovation projects linked with industry needs; ii) Development of quality control and certification systems for livestock products and related services; iii) Establishment of forward and backward marketing linkages across the value chain; iv) Strengthening research and development collaborations between universities, industry partners, and entrepreneurs. These initiatives aim to facilitate the production of safe and high-quality food and biotechnology products for both local consumption and export markets.

The proposed Livestock Technopark model further supports these objectives by creating an autonomous governance framework that integrates academia, industry, and government, enabling innovation-driven enterprises and generating decent employment opportunities across the livestock value chain, in line with SDG 8 (Decent Work and Economic Growth).

Institutional Responsiveness and Peace Building (SDG 16 – Peace, Justice and Strong Institutions)

Public sector institutions responsible for livestock extension, research, and education often operate within predefined mandates and limited resources. As a result, their services mainly address routine needs—such as treatment of sick animals or limited awareness campaigns—while the broader requirements of farmers, processors, and investors regarding market development, investment facilitation, and technological innovation remain insufficiently addressed. Through consultancy assignments with the Food and Agriculture Organization and the International Trade Centre, Dairy Science Park contributed to the development of livestock policies and action plans aimed at improving governance and strengthening value chains in the livestock sector. These policy initiatives emphasized the Triple Helix Model of Good Governance, based on an Academia–Industry–Government nexus, which promotes collaboration among research institutions, private sector enterprises, and public authorities.

The proposed governance framework was well received by stakeholders, including academic institutions, livestock producers, processors, and potential investors, who recognized the need for stronger coordination and market-oriented development of the livestock sector. However, the level of engagement from some public sector organizations remained limited, highlighting the need for institutional reforms that encourage greater responsiveness, collaboration, and innovation.By strengthening institutional cooperation and improving governance structures, this initiative contributes to peace, stability, and economic prosperity in the conflict-affected regions of Khyber Pakhtunkhwa, while helping to reduce conflicts of interest among producers, processors, consumers, and regulatory institutions, in line with SDG 16 (Peace, Justice and Strong Institutions).

## k. Good Governance and Policy Reforms


***Chief Minister KP, Mr Mehtab Abbasi took notice of the expert opinion of Prof Qureshi***

The Livestock Development Plan was prepared on advice of the Ex-Chief Minister Sardar Mahtab Ahmad Khan Abbasi (Letter No.SOIV/CM/NWFP/9(7)/98/3566 dated 30-11-1998), for productive utilization of provincial livestock resources targeted at export. The Plan was updated to Dairy Science Park through three successive international workshops during November 2011, 2013 and 2015 at the University of Agriculture Peshawar.

***i. Endorsement by President KPCCI and provincial legislatures***

The President Khyber Pakhtunkhwa Chamber of Commerce and Industries (KPCCI), Mr Zahidullah Shinwari approved the Standing Committee on Livestock for integrating various stakeholders. The Minister for Agriculture, Sardar Ikramullah Gandapur inaugurated the Livestock Business Facilitation Desk at KPCCI/SMEDA.

During the meeting Dean, Faculty of Animal Husbandry and Veterinary Sciences, Agricultural University Peshawar (AUP, Professor, Subhan Qureshi) gave a detailed presentation on Dairy Science Park. Replying to a question the Dean informed the private sector that Punjab is best suited for dairy production. However, the Khyber Pakhtunkhwa, mostly consisting of a hilly terrain and arid regions can support meat production though sheep and goats, cattle and buffalo in some regions.

The small poultry farms have been adopted as small businesses, which need support to produce quality feed at competitive rates. Huge investment in the sector must be made after appropriate feasibility studies and in phase manner. For controlling zoonotic diseases, Professor Subhan Qureshi said that the University is working closely with the Relief International Pakistan. Similarly, he said that SMEDA is also constantly supporting the sector and was an active partner of the University during Dairy Science Park 2011. The delegates from the FAHVS discussed in detail the potential of business plans using livestock activities as a model especially focused on graduate entrepreneurship.

Speaking on the occasion, the President KPCCI highly appreciated the presentation and realized the potential of the sector playing its due role in eradicating poverty and creating employment opportunities. It was agreed that this sector would be further strengthened by proper mechanism for the Standing Committee on Livestock was approved at the chamber. The Special Assistant to the Chief Minister on Law, Mr Arif Yousaf supported legislative reforms presented under the DSP, to protect the interest of the stakeholders.

KP Minister for Agriculture Sardar Ikramullah Gandapur inaugurating the Livestock Business Facilitation Desk-DSP at KPCCI with President KPCCI, and Dean FAHVS, AU-Peshawar, on May 21, 2014

The Second International Conference and Industrial Exhibition on Dairy Science Park was inaugurated by the President KPCCI, Mr Zahidullah Khan Shinwari and attended by representatives from Academia, Industry, Government and the Civil Society of Pakistan, Turkey and Afghanistan.

The President KPCCI established a Standing Committee on Livestock at the Khyber Pakhtunkhwa Chamber of Commerce and Industries to analyze the strengths and weaknesses in the production and marketing lines and work on strategies to provide immediate and long term solutions. The Working Group on Livestock and Poultry Business at the SMEDA will be utilized for modulating and supporting the SMEs in the private sector through involvement of graduates and their integration with service providers and marketing actors.

Qualified graduates with aptitude, commitment and required skills shall be encouraged and supported to initiate their own entrepreneurship in livestock and poultry production, processing and marketing under various schemes. New investment opportunities in the livestock sector need to be highlighted through workshops and seminars in consultation with stakeholders, in partnership with the KPCCI, the provincial government and the University.

All types of animal trafficking will be covered under regulation and documentation within the province and along the national and international borders, provided with appropriate technical and legal support. The present production lines in livestock and poultry will be supported with abattoirs, meat processing, storage and transportation faculties at various sites. Linkages with the national and international Industry will be strengthened involving graduate internees in livestock production, value addition and marketing system and the business/civil society organizations in extension, teaching and research.


*Pak-Turk Academia Industry Linkages established during DSP 2013*

***ii. Endorsement by the Senior Minister Local Government***

The Senior Minister Khyber Pakhtunkhwa province, Mr Inayatullah Khan inaugurated the Third International Conference and Industrial Exhibition on Dairy Science park at UAP. He acknowledged efforts made under the DSP focused at efficient utilization of the natural resources available in the Khyber Pakhtunkhwa province for the welfare of the people. DSP was declared as a tool to fill the gap between the policy makers, academia and industry. The Senior Minister agreed with the establishment of an autonomous DSP board, focused on the burning issues of self employment and hygienic food production. The Board will provide an infrastructure for Business Incubation Centre to promote industrial research under an Endowment Fund, with a total cost of Rs.500 million).

Mr Inayatullah Khan endorsed the comments of the worthy VC and Dean that our natural resource could not be utilized so for the uplift of the people, and further said that the province of KP has the potential for generating 30,000 MW of hydel power; 600 million barrels of crude oil; 10 trillion cubic feet of natural gas; and millions of acres of barren land in the Southern districts. In addition, the province can generate a lot of revenue from tourism. So far we have failed to exploit these potential. However, we do not need to spread disappointment and fear in the youth, rather to devise policy by bridging the gap between the policy makers, academia and industry.

The Senior Minister declared the DSP as the bridge to fill up the gap. He informed the participants that his ministry has allocated a sum of 200 million for the establishment of a model slaughter house. He endorsed the idea of establishment of an autonomous DSP Board which will be run by eminent scientists, industrialists and farmers' representatives. Later on, the Senior Minister chaired a high level meeting held on 3-3-2016 and agreed on a proposal of DSP for implementation of an ADP project for establishing a Modern Slaughter House. Consequently, a Summary was initiated for the Chief Secretary which was supported by the Additional Chief Secretary. A note was initiated by the Senior Minister for Establishment of the Task Force on Dairy Science Park which was approved by the Chief Minister on 2-8-2017.

*Senior Minister Local Government, GoKP approved the Dairy Science Park Task Force was endorsed which was consequently, approved by the Chief Minister GoKP*

***iii. Endorsement by Chairman HEC***

The HEC accepted DSP as a Center of Excellence. Under the "Center of Excellence on Dairy Science Park" we have suggested conversion of KP and FATA into an export base for Halal Meat and other food products and the HEC has included it in the agenda for the Sector Development Program. CEDSP is supposed to work as an autonomous degree awarding institution.

A memorandum of understanding for Collaborative Biorisk Management Initiative (CBMI) was signed between Dairy Science Park (DSP), Khyber Medical University (KMU), the University of Agriculture, Peshawar (UAP), and Higher Education Commission of Pakistan (HEC). The signing ceremony was supervised by Prof Mukhtar Ahmed, Chairman HEC. The MoU was a follow up of a consultative workshop held recently at Bangkok, Thailand, participated by experts of DSP, led by Mr Arif Yousaf, Special Assistant to Chief Minister Khyber Pakhtunkhwa on Law.

The MoU will cover consultative meetings of experts from various disciplines of biological sciences to develop curriculum on Biorisk Management. Biorisk Management Curriculum will be designed, developed, and implemented as a separate discipline and its incorporation into the existing curricula of life sciences as it relates to courses where infectious agent handling occurs. Training of stakeholders will cover implementing the newly developed curriculum and to reach out to other universities to design, develop, and implement similar curriculum to establish Biorisk Management Curriculum and practices throughout the region.

***iv. Development of KP Livestock Policy***

A meeting was held at the University of Agriculture Peshawar and the Khyber Pakhtunkhwa Livestock Policy prepared by Prof Dr Muhammad Saleem Chaudhry on advice of the ruling party, was finalized. The meeting was hosted by the Dairy Science Park and participated by representatives of the Director General's Livestock and Dairy Development Department (Extension and Research Wings), Dean FAHVS, The University of Agriculture Peshawar and the private sector represented by the Dairy Science Park.

A team of Dairy Science Park comprising Prof M Subhan Qureshi, Chief Patron DSP, Director World Bank Quetta and Mr Shakoor Ahmad, SMEDA, called on the Governor Balochistan, Mr Muhammad Khan Achakzai, in his office. The Governor was briefed on the launching of the Balochistan Chapter of Dairy Science Park, Peshawar and was invited to attend the Fourth International Conference and Industrial Exhibition of DSP at Konya, Turkey to be held on November 1-5, 2017. The Governor appreciated the mission and considered it as an important tool for the welfare of the people of Balochistan.

The management of the Agriculture University Peshawar (AUP) locked horns with Chief Patron of the Dairy Science Park (DSP), Professor M Subhan Qureshi, a former Dean of the Faculty of Animal Husbandry and Veterinary Sciences (FAHVS) over his activities to promote the use of modern technology for the development of livestock sector (Business Recorded Nov 14, 2017). Additional Chief Secretary KP was approached vide letter dated 10-4-2018 by the Chief Patron DSP, to integrate the real issues faced by the stakeholders across livestock value chain, into the then proposed Livestock Policy KP, in light of the consultation made under the chairmanship of Senior Minister and approval of the Task Force DSP by the Chief Minister KP. The Advisor to Chief Minister KP on Livestock was approached vide letter to utilize the funds (Rs.500 million) allocated for establishment of Insaaf Veterinary Clinics, for establishing viable entrepreneurship models like production farms, breeding farms for livestock and poultry, meat processing facilities, veterinary services centers, diagnostic and quality control laboratories.

*DSP facilitated development of KP Livestock Policy chaired by Prof Dr M Saleem Chaudhry on advice of the ruling party PTI*

***v. Modulating Special economic Zones for Meat and Dairy Production***


This project aimed at, "Developing Enterprising Capacity Of Livestock And Poultry Farms In Khyber Pakhtunkhwa, Pakistan for employment generation and export" was prepared by Prof Dr M Subhan Qureshi Dean Faculty of Animal Husbandry and Veterinary Science and checked by Prof Khan Bahadar Marwat, Vice Chancellor, The University of Agriculture Peshawar.

*Justification of the proposal:*

The Peri-urban Dairy Farming is a part of the agricultural production system, a prerequisite to alleviation of poverty. It supplements other income generating activities to eradicate poverty and create adequate opportunities for enhanced rural and peri-urban employment, income generation and economic access to food. The horizontal expansion in dairy farming is still in progress. The increasing human population of the urban areas, the rising income levels and the awareness about the need of animal proteins in the human diet, has resulted in increasing demand for milk and meat. This demand for food items and the rising levels of prices, calls for expansion of the dairy and livestock industry.

*Interaction with Turkish Organizations:*

The author, Prof Qureshi, visited Turkey and attended the International Conference on Applied Life Sciences from 10 to 12 October, 2012 at Konya. Improved seed varieties of Atta Habib and Siran-2010, developed at this University, were delivered to Mr Ali Beyaz of Beyaz INSAAT at Istanbul for trials in arid and irrigated areas. After the conference the author visited Selcuk University in Konya facilitated by Dr Mithat Direk, Dr Sukru Dursun

and Dr Selda Seyfi. A meeting was held with Prof Dr Ahmet Guner, Dean Faculty of Veterinary Sciences for exploring collaborating areas. Meat import was identified as an important activity of Turkish Trade and the availability of a good resource base for production of such meat at the Khyber Pakhtunkhwa was identified as a potential export base for meeting these demands. On the following day a visit was made to various departments and laboratories of the faculty.

A visit was made to Intermak Dairy Company and collaboration was discussed with Mr Husamettin Sonmez, General Manager. They have been producing dairy equipment and exporting to various countries. Such equipment can be considered for import to Pakistan at a relatively cheaper cost than the European products. Another visit was made to a commercial dairy farm having 45 kg/day a peak milk yield and 25 averages. The farm was well managed and was showing a good profitability. A dairy company Enka Sut Ve Gida Mamulleri San Ve Tic A.S. was visited, which is already exporting some dairy products to Pakistan through a representative.

*Social norms at dairy farms:*

Social norms are shared values and expectations which vary from one society to another and from one situation to another. Norms range from crucial taboos, such as those against incest or cannibalism, to trivial customs and traditions, such as the correct way to hold a fork. Norms play a key part in social control and social order. Dairy farms provide a unique environment for development of special social norms. The dairy farms are located in the peri-urban areas of the major cities to meet the demand of milk of the urban populations. The farms are established without scientific planning for construction of buildings. roads, water supply and drainage and other requirements of the people and the dairy operations. The farmers are taking care of 57 million dairy animals (cattle and buffaloes) in Pakistan, approximate value being RS.1.5 trillion and contributing to the national economy to the tune of Rs.1.2 trillion per annum. But they do not get the desired contribution from society.

*Living standards:*

Peri-urban dairy farms are usually owned and managed by Gujars, the dairy farmers, their families and the hired labor. Their living standard is low due low profitability of the farms. The high and non-regulated cost of inputs and state-controlled lower price of the products make the profit margin low. Lack of state-subsidy and hostile marketing systems bulldoze enterprises. Under such circumstances the living standard of the dairy farmers has definitely deteriorated. The farmers have little chance to send their children to better educational institutions, which usually are expensive. The children discontinue their education after passing "class" at school. A so-called self employment is provided to the children by their parents at the dairy farms and their potential for better contribution to the society is wasted.

*Investment behavior:*

Establishment of the traditional dairy farms is based upon opportunity cost, instead of new investment. The huge investment made by the ancestors of the farming family and the rising levels of unemployment compel them to stick to the business, willingly or nonwillingly. The farming family tries to continue the business without calculating the

financial inputs and products, and the products have been reported to recover only 75% of the cost of productivity. Under such types of income levels the dairy farmers possess no capital to invest in strengthening their business. The traditional peri-urban dairy farmers survive under miserable conditions for decades or their business is squeezed to a smaller size or total extinction. The status of non-investment makes the operations inefficient and resultantly. the production cost further increases, making the profit margin further narrower.

*Interaction with markets:*

Dairy farmers have to interact with markets for procurement of inputs and sale of products. The marketing system is hostile to the farmer and attempts to get benefits out of his business without providing support and productive inputs. Resultantly, all the market forces around the dairy farm get wealthier while the dairy farmer gets poorer and ultimately, is compelled to abandon his business. Buffaloes are supplied to the farms by dealers at very high interest rates, sometimes exceeding 50% per year. The amount has to be returned in installments, which come from sale of the milk. Half of the amount earned from sale of the milk is spent on paying the installment while about half if paid to the feed dealer, remains very little with the farmer for household expenditure. The quality of animals and feed supplied to the dairy farm is usually inferior.

*Rationale of project:*

The present project is focusing on analyzing the current status of health, productivity, nutrition, fertility and management aspects of the local farming. The inefficient practices would be documented and their economic impact would be worked out. Improved practices based upon studies to be conducted under the project as well conducted elsewhere, would be introduced into the local production system. A quality control system would be established for the feed, biologics and medicine as recommended under local and international laws. Analytical methods would be developed to predict the safety and quality of food products. Non-destructive spectrophotometric measurements will be developed to predict the quality and safety of food products. The relevant agencies would be advised on the practical and legal impact of food safety regulations including product liability, commercial law and intellectual property. Economic evaluation of the enterprises would be made to assess the feasibility of the improved production system for employment generation.

*Target areas*

The proposed project will focus on livestock and poultry farmers interested in meat and dairy production as an enterprise. The project will be executed at four stations, Peshawar, Mardan, Swat and DI Khan and the adjoining districts and tribal areas. Baseline surveys/situational analysis will be conducted after which the potential pockets/villages will be selected for further intervention. HUJRA, SRSP and other appropriate organizations having social capital and established setups would be involved in project implementation.

*Goals and objectives*

1. Improving the quality standards of medium sized sheep, goats and poultry farms,

compatible to those set by importing countries through building capacity of farmers; establishing a quality control ISO certified central veterinary laboratory

2. Technology incubation at medium-sized farms through business incubation center and strengthening their linkages with service providers like input suppliers, marketing, financial and development agencies

3. Further enhancing the quality of teaching and research through involvement of graduate internees and postgraduate students producing highly skilled manpower possessing business leadership and creating opportunities for self employment

4. Value addition in meat production and processing through a network of modern slaughter houses backed up by quality control and cold storage.

5. To establish at least one farmer welfare center in each selected region of the project to provide basic needs of the farms in terms of feed (Concentrate), Vaccination, and basic Health inputs.

*Work plan*

The available dairy, sheep, goats and poultry herds in the central, northern and southern regions of Khyber Pakhtunkhwa would be registered by the project. The existing state of productivity and profitability would be documented and the barriers impeding profitability would be split into biological and marketing categories. Among the biological factors, the breeds would be compared for feed efficiency, fertility, health status and growth rates. Nutritional requirements/supply will be recorded.

Research studies would be initiated for postgraduate students and hired staff. The studies would focus on management interventions for enhancing ovulation rates, conception/birth rates, growth rates, feed conversion efficiency and health status with special focus on debilitating, parasitic, infectious and zoonotic diseases of small ruminants. The available local plants in the project areas would be evaluated for toxic, medicinal and nutritional properties. The local breeds would be evaluated as candidates for business entrepreneurs.

Alternate feed sources would be explored and digestibility trials would be conducted to evaluate the transfer efficiency of inputs into products. Reproductive efficiency of various breeds would be investigated with special emphasis on the number of live births per 100 animals. Improved strategies would be demonstrated for improving this trait. Health parameters would be recorded regarding the current management practices and prevalence of parasitic, bacterial, viral, metabolic and mal-nutritional diseases. The economic losses associated with various health disorders would be documented and intervention models would be developed to minimize these losses.

Three Farmers Welfare Centers would be established to provide a platform for the farmers, scientists and marketing partners to abridge the gap among the farmers and service providers. The materials required for improved health, nutrition and fertility would be made available through sale of commodities at reasonable rates, training and demonstration of improved practices by experts and extension workers.

One Business Incubation Center would be established for demonstrating livestock based entrepreneurs. The change in the profitability would be documented and analyzed. Three model abattoirs supported by chilling facilities would be introduced at farming clusters. Chilled vehicles would be provided for transportation of meat from field abattoirs to the central Unit at Peshawar. Hazard analysis and critical control point (HACCP) and Halal Certification would be introduced at the production, processing, storage and marketing setups.

A Quality control system would be established through a Central Veterinary Laboratory for the feed, biologics and medicine as recommended under local and international laws. Analytical methods would be developed to predict the safety and quality of food products. The business incubation concept of HEC will be introduced into the enterprises developed under the project for employment generation.

*Cost Estimates*

Grand total cost of the project estimated during 2012, was Rs.110 million equivalent to TL 2.02 million, comprising travel to Pakistan and Turkey, Central Veterinary Laboratory, Consumables, Meat Processing Unit, Farmers Welfare Center, Business Incubation Center, postgraduate research and Miscellaneous expenditures.

*Expected output*

The existing farms are underutilized and profit/health status would be improved significantly through good livestock practices, applied research, value addition and marketing support. The cost per unit produced would be reduced benefiting the consumers. The farming system would be producing certified food for local consumers and the International Halal Food Market, with special emphasis on Turkey.

*A typical Peri-urban Dairy Farm at Nasirpur, Peshawar*

***vi. KP Livestock Plan Submitted under FAO-UN Consultancy***

The Food and Agriculture Organization of the United Nations, Islamabad, entrusted Prof. M. Subhan Qureshi, President of Dairy Science Park, with a National Consultancy assignment for preparation of the KP Livestock Action Plan 2019. The assignment aimed to support the people of Khyber Pakhtunkhwa, particularly those dependent on livestock resources in conflict-affected and economically vulnerable areas.

The consultancy was well aligned with Prof. Qureshi's professional background, which included more than three decades of service in the provincial livestock sector as a civil officer, followed by academic leadership as Professor and Dean at The University of Agriculture Peshawar. His experience also included active engagement with farmers, processors, entrepreneurs, universities, policymakers, and international organizations through the platform of Dairy Science Park.

*Background Situation of the Sector*

The livestock economy of Khyber Pakhtunkhwa possessed significant potential in dairy, meat, poultry, fisheries, and value-added food production. However, a large number of livestock keepers, dairy farmers, poultry growers, butchers, and fish farmers belong to economically weaker groups, many with limited landholdings or no land at all. Despite managing valuable biological assets and supplying essential food commodities such as milk, meat, eggs, and fish, many households remained trapped in low-income conditions.

Several structural challenges were observed across the value chain:

- Limited access to quality feed, breeding inputs, vaccines, diagnostics, and extension support
- Weak market organization and inadequate cold chain systems
- Absence of traceability and quality assurance mechanisms
- Limited incentives for hygienic and premium food production
- Price distortions affecting genuine producers and processors
- Weak linkages between research institutions and commercial farming
- Insufficient entrepreneurship support for educated youth

The mission also noted that around ten public and private institutions had mandates relating to livestock development, including extension, research, education, markets, slaughterhouses, municipal regulation, food safety, trade, and farmer welfare. However, these functions often operated in isolation, reducing overall efficiency and impact.

*Consultative Process and Proceedings*

The consultancy adopted a consultative approach involving interaction with diverse stakeholders across the livestock value chain through visits to DI Khan, Bannu, Swat, DG VRI, DG LDD, DG Fisheries, DC Bannu, Tehsil Nazim Khwazakhela, UAP, AWKUM, etc. Inputs were sought from farmers, processors, members of parliament/district councils, traders, veterinary professionals, academics, public officials, and development actors.

A wrap-up consultation was later held with representatives of four major stakeholder groups:

1. Livestock & Dairy Development Department – Extension Wing
2. Livestock & Dairy Development Department – Research Wing
3. The University of Agriculture Peshawar
4. Khyber Pakhtunkhwa Livestock Farmers Welfare Association

The consultation recognized that the livestock farmer is the primary stakeholder of the sector, while most public institutions serve as support systems. Participants discussed that prosperity of farmers would directly improve food security, employment generation, consumer welfare, and tax revenues. The above four major stakeholders were considered with equal weightage of 25% each.

The proceedings also reflected differing institutional opinions regarding future governance arrangements. Some participants favored continuation of conventional departmental approaches, while others supported a broader multi-stakeholder institutional model capable of integrating innovation, research, private investment, and market reforms.

*Key Findings*

The mission concluded that the province required a transition from routine service delivery toward a modern livestock development model based on enterprise creation, technology adoption, quality assurance, and coordinated governance. Important

observations included:

- Farmers needed stronger income protection and market access
- High-quality producers required encouragement rather than administrative barriers
- Research wings required modernization and stronger laboratory accreditation systems
- Universities needed closer linkage with industry and recognition of professional programs
- Graduates required enterprise pathways rather than dependence on limited government jobs
- Consumers required access to hygienic, halal, and traceable food products

*Proposed Reform: Livestock Technopark Peshawar (LTP)*

To address these challenges, the consultancy proposed establishment of an autonomous Livestock Technopark Peshawar (LTP) under a governance framework based on the Academia–Industry–Government–Society Nexus. It was recommended that the initiative could begin as a Task Force through executive notification and later evolve into a statutory body through legislation or ordinance. The proposed institution was envisioned to possess regulatory, administrative, financial, and coordination powers necessary to drive sectoral transformation. The model was designed to bring together all stakeholders under shared authority and responsibility, including farmers, processors, researchers, universities, service providers, regulators, investors & consumers.

*Strategic Functions of LTP*

The proposed Livestock Technopark would focus on:

- Development and replication of entrepreneurship models
- Commercialization of university and research innovations
- Modern slaughtering, meat processing, and dairy value addition
- Quality certification, traceability, and branding systems
- Export facilitation for halal meat and biotech products
- Skill development for youth and graduates
- Promotion of public-private partnerships
- Policy coordination among fragmented institutions

*Projected Impact*

The consultancy estimated that, with effective implementation, the initiative could generate thousands of direct employment opportunities, each capable of supporting additional household livelihoods. It was projected to stimulate production of hygienic, halal, and organic foods worth billions of rupees annually, with a portion potentially entering export markets. The model also offered career pathways for graduates in veterinary sciences, engineering, medicine, management, and social sciences by converting academic knowledge into practical enterprises. Consumers in urban and rural markets would benefit through safer and traceable food products.

*Governance Significance*

The proposal reflected principles of good governance, where economic growth is promoted through collaboration rather than fragmentation. Sustainable livestock development depends not only on budgets and infrastructure, but also on institutional balance, inclusion, accountability, innovation, and participation of the private sector.

*Legacy and Contribution of DSP*

This FAO-supported consultancy remains one of the important policy contributions associated with Dairy Science Park. It demonstrated the Park's continuing role in translating field experience, academic expertise, and stakeholder consultation into practical reform proposals for employment generation, food security, and modernization of the livestock sector in Khyber Pakhtunkhwa.

*Institutional Bottlenecks and Conflict of Interests*

During the consultancy process, an important challenge identified by the mission was the limited scope of the revised Terms of Reference (TORs), which were primarily aligned with the Livestock & Dairy Development Department – Extension Wing. While extension services constitute an important pillar of the sector, they represent only one component of the broader livestock value chain. Other critical stakeholders—including the Research Wing, universities, farmers' organizations, processors, traders, and service providers—required equal consideration within a balanced reform framework.

At the time, the Extension Wing possessed the largest administrative network of veterinary institutions and commanded a dominant share of sectoral operational resources. As a result, policy formulation processes were perceived as heavily centered around conventional extension structures, while the perspectives of research institutions, academia, and private-sector actors remained underrepresented. The consultancy observed that this imbalance had several long-term implications:

- Limited institutional growth of the Research Wing
- Insufficient laboratory accreditation and quality-control systems
- Weak feedback mechanisms for vaccine quality and field performance
- Continued dependence on imported vaccines instead of strengthening domestic production capacity at the Veterinary Research Institute
- Reduced incentives for highly qualified researchers, many of whom migrated toward universities or other institutions
- Limited participation of research institutions in major development initiatives

*Challenges in Veterinary Higher Education*

The province's public universities—including The University of Agriculture Peshawar, Gomal University, Abdul Wali Khan University Mardan, and University of Dir Sheringal—had been producing graduates in veterinary and postgraduate disciplines. However, professional accreditation challenges, limited institutional support, and weak policy coordination were affecting the quality and recognition of veterinary education in the province.

*Constraints Faced by the Private Sector*

The private component of the livestock economy—including farmers, poultry growers, processors, marketers, and veterinary service providers—was facing regulatory, financial, administrative, and marketing barriers. Many stakeholders believed that development funds and incentives were concentrated in routine public-sector structures rather than being used to stimulate entrepreneurship, productivity, and value addition. At the field level, the prevailing service model remained largely treatment-oriented through veterinary hospitals, dispensaries, and mobile clinics. The consultancy argued that a modern livestock development system should instead prioritize disease prevention, productivity enhancement, enterprise growth, and profitability of healthy animals.

*Justification for Reform*

These structural imbalances provided the key justification for proposing the Livestock Technopark Peshawar (LTP) as a multi-stakeholder platform based on the Academia–Industry–Government–Society Nexus, ensuring that all components of the livestock value chain could participate in planning, innovation, and growth on equitable terms.

*Consultation with stakeholders at Tehsil Mayor Office Khwazakhela*

***vii. Balochistan Livestock Breeding Policy 2022***

It was a great experience for the President Dairy Science Park, Prof M Subhan Qureshi, 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 him to utilize his 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 for 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, BUITEMS, 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.

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.

*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. 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, poultry and fish; 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, poultry and fish production

*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 and fish 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, cattle and fish, 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.

*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, poultry and fish 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.

*Action Plan and Implementation strategy*

*1. Policy Shift*

- 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.

- Zonal requirements for various livestock breeds, using Jersey semen in areas with fodders and water scarcity and HF semen in other areas.
- 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.
- 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.
- SPU and AI Centres would be strengthened at district level through innovations, advanced research and ease of doing business.
- Strengthening of Embryo Transfer Lab.

*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. 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. Access of the interested commercial farmers to such high-quality inputs, may be facilitated through the proposed HHP and LEDC.

*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.

*5. Development of Livestock Farms*

- 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:
- Funds may be arranged by 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 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.
- Private farmers may be engaged in the process through the Open Nucleus Breeding System (ONBS), providing them with elite animals and similarly buying back.
- 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.
- An 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 camel. The semen produced may be utilised for breeding of local livestock population and may be offered for sale at national internal markets.
- 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.

*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.

*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.

*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) BUITEMS (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.

*9. Engagement of Relevant PSOs*

Nine public sector organizations (PSOs) were engaged under the Mission namely, Livestock, Forest, Local Government and Industries Departments for assessing their current and potential roles in the Policy related issues; BU, BUITEMS, 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.

*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).

*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.

*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, fish & 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.

*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).

*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.

*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 for entrepreneurship development.

*Expected Outcome*

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.

***viii. Resistance to Policy Reforms***

*Resistance by Secretary Agriculture GoKP*

On advice of the Senior Minister Khyber Pakhtunkhwa, the Chief Minister approved a Task Force on DSP to overcome bureaucratic hurdles faced by stakeholders across livestock value chain. Academia Industries Linkages, Entrepreneurship Development, Public Private Partnership, Consumers Preferences, Quality Control for hygienic and Halal status of products and sustainability through Endowment Fund, were the main features of the Terms of Reference. There was a conflict of interests as the farmers and processors are working without any visible support from the public sector organizations. Development funds are provided to government organizations with no say of the stakeholders. Rates of milk and meat are fixed by district administration at lowest without considering the production cost or quality based grading.

So, secretary agriculture Government of Khyber Pakhtunkhwa, Mr Israr did not issue relevant Task Force notification, violating the directive of Chief Executive of the provincial government.

Needless to mention that in addition to international support, the previous authorities so the provincial government had endorsed the concept of Dairy Science Park in the larger interest of the province and the region. The Authorities include Ex-Chief Ministers Akram Khan Durrani and Sardar Mehtab Khan Abbasi and Ex-Additional Chief Secretary, Mr Muhammad Azam Khan.

*Resistance by Vice Chancellor UAP and death of wife of Prof Qureshi*

Salary of the Chief Patron, Prof M Subhan Qureshi, Prof and Dean Veterinary Sciences, University of Agriculture Peshawar (UAP)/President Dairy Science Park was stopped by the Vice Chancellor Prof Noor Pao Khan for a prolonged period of seven months leading to frustration in the family and ultimately death of wife of Prof Qureshi.

Earlier, Prof Zahoor Ahmad Swat, Vice Chancellor UAP, signed a Memorandum of Understanding with President DSP and Vice Chancellor Khyber Medical University under supervision of Prof Mukhtar Ahmad, Chairman Higher Education Commission of Pakistan.

The MoU covered consultative meetings of experts from various disciplines of biological sciences to develop curriculum on Biorisk Management. Biorisk Management Curriculum will be designed, developed, and implemented as a separate discipline and its incorporation into the existing curricula of life sciences as it relates to courses where infectious agent handling occurs. Training of stakeholders will cover implementing the newly developed curriculum and to reach out to other universities to design, develop, and implement similar curriculum to establish Biorisk Management Curriculum and practices throughout the region.

During the meantime, the Fourth International Conference and Industrial Exhibition on Dairy Science Park was held at Konya Turkey, participated by delegates from 20 countries, 50 from various parts of Pakistan.

The Higher Education Commission of Pakistan offered establishment of the Center of

Excellence on Dairy Science Part at UAP, with an initial allocation of Rs.400 million. However, Prof Zahoor Swati VC UAP did not allow Prof Qureshi President DSP/Dean FAHVS UAP to present the case and advised him to stop all activities of DSP. Prof Qureshi considered the advice contrary to the interests of the University and people of the Region and refused to obey. Prof Swati removed the huge data prevailing over a decade regarding organization of of the biennial international convergences and exhibitions series, international workshops on biorisk management under sponsorship of Sandia National Labs USA, technical, legal and administrative support to the livestock producers and processors; and policy reforms under supervision of the Senior Minister GoKP Mr Inayatullah Khan.

*Resistance by DG Livestock GoKP in FAO-UN Reforms Process*

The good offices of Food and Agricultural Organization of the United Nations at Islamabad, Pakistan appointed Prof Dr Muhammad Subhan Qureshi as National Consultant Livestock and Dairy Development under Program/Project Number TCP-PAK 3701-C1/AFOR Program with duty station at Peshawar for a period of 45 Days, to report to Farrukh Toirov, AFOR Program, FAO, Islamabad. Personal Service Agreement (Manual Section 319) was signed with Ms Mina Dowlatchahi FAO Representative Pakistan. The Mission started working at FAO Peshawar on 10 June, 2019. Mr Waleed Mahdi and Dr Sanaullah Khan have been taking care of the local facilitation of the Mission as IPC and Responsible Officer of the project, to complete this task while Ms Faiza Younas facilitated at FAO Islamabad.

The mutually agreed TORs required development of the Action Plan with estimated budget for Livestock Sector Development and Transformation, based on KP Livestock Policy; covering regulatory issues, value chain development, private sector engagement and overall required capacity at provincial and district levels; to elaborate on roles and responsibilities of various stakeholders focused on institutional reforms; review the current policy/strategies/program and align livestock sector priorities.

Prof Qureshi worked hard in collaboration with the Livestock Farmers and Processor Organizations, civil society, line departments/universities, elected representatives of provincial assemblies and district councils and expert individuals. Weaker stakeholders were identified across the Livestock Value Chain and Livestock Technopark Peshawar was suggested as a Triple Helix Good Governance Model of Academia-Industry-Government Nexus. A conflict of interest raised between the Powerful and weaker stakeholders. Dr Sanaullah Khan facilitated the powerful stakeholders to bulldoze the FAO KP Livestock Action Plan 2019 in collaboration with Dr Sher Muhammad, Director General Livestock and Dairy Development Department GoKP, reported in FAO KP Livestock Action Plan Part II.

*Prof Qureshi denied legal pension rights*

A discriminatory treatment was extended to Prof Qureshi by the University of Agriculture, Peshawar (UAP) followed by the consequent failure of the system to provide the relief already granted to him by the Honorable Peshawar High Court vide order dated 28-5-2019 on W.P. No. 1527/2018. The discrimination may be summarized as under:

*1. Ignoring 36 Years of Verified Service:* The UAP administration ignored his 22 years

government service (7-8-1983 to 12-1-2005) verified by the office of the Accountant General Khyber Pakhtunkhwa (No.Pension (M)/(M)/FS/2008-09/5004/-10 dated 19-1-2009) and 14 years service at UAP as Professor BPS-21/Dean (13-1-2005 to 20-3-2019) (No.187/8/S-I/UAP dated 10-10-2018) and denied his lawful pension benefits.

*2. Relief Granted by Peshawar High Court in 2019:* Peshawar High Court provided him relief via Judgement dated 28-5-2019 under WP No.5127-P/2018, against his discrimination, directing UAP to deal with his case in the same terms as those of WP No.5120-P/2017. Consequently:

- UAP notified his switchback from TTS to BPS-21 vide office order No.153/S-1/UAP dated 7-10-2019.
- His Last Pay Certificate was issued via No.721/S-1/UAP dated 23-10-2019.
- His superannuation pension was notified by UAP vide No.187/8/S-I/UAP dated 10-10-2018 and was declared eligible for pension benefits as per rule.

*3. Illegal Reduction of Last Pay:* However, his last pay was reduced via order No.Nil/S-1/UAP dated 11-11-2019 without any legal grounds; although Rs.1,602,964 were deducted as Pension Contribution via the Classification Sheet of my pension bill dated 18-12-2019.

*4. COC No. 817-P/2020 and Its Unjustified Disposal:* Hence, COC No.817-P/2020 was filed on 24-12-2020, against wilful violation of the Judgement/Order under WP No.5127-P/2018 dated 28-5-2019. The honorable PHC blocked/disposed of the COC 817-P/2020 vide Judgement dated 31-5-2022 on the basis that UAP had challenged it through CPLA No.606/2019 dated 12-9-019 at the Supreme Court. This resulted in withholding of his pension and validated the discriminatory conduct noted earlier.

*5. WP No. 59-P/2024 Filed by 72 Aggrieved Retirees:* A group of 72 retired employees, including Prof Qureshi, filed WP No. 59-P/2024 seeking release of long-pending pension dues. This Honorable Court, on 09-09-2025, directed UAP to constitute a Grievances Committee. Unfortunately, the Committee again denied my pension liabilities (Serial No. 9), reiterating the discrimination earlier identified, despite my comprehensive Appeal dated 19-09-2025. I communicated my concerns to the President OBA on 2 December 2025.

*6. Violation of Court Orders:* The ongoing denial by UAP stands in clear violation of:

- PHC Judgment dated 28-05-2019 in WP No. 5127-P/2018.
- Supreme Court Judgment in Civil Appeal No. 48 of 2013 (dated 21-02-2013) directing UAP and others to release pension liabilities within two weeks of retirement.

An Appeal was submitted to the Chief Justice on 4 Dec 2025 with the Prayer, in light of the above, with the request that:

A. COC No. 817-P/2020 may kindly be restored, and
B. UAP may be directed to implement the PHC Judgment dated 28-05-2019 in WP No. 5127-P/2018 and release my long-delayed pension liabilities without further discrimination and hardship.

# Annexures

## *1. Dairy Science Park (The Society/DSP)*

A society emerged at the University of Agriculture, Peshawar, Pakistan, registered with the "Constitution of Dairy Science Park", registered under Societies Registration Act XXI of 1870 on 2 July 2015, Reg No.4582/5/85989, at Peshawar, Government of Khyber Pakhtunkhwa. The "Society" shall operate as a "Non Profitable Society" with funds and/or inputs utilized for the betterment and development of Halal investment would be invited interest-free and profit based according to Islamic principles, and food will be available to the consumer with the Halal label under the Park.

The Society will be supporting self-employment and hygienic food production in partnership with the development partners like UN as SDG Action 40154. The Senior Minister Local Government, Khyber Pakhtunkhwa, Mr Inayatullah Khan chaired a high level meeting on 3-3-2016 and agreed on a proposal of DSP for establishment of DSP Board and implementation of an ADP project for establishing a Modern slaughterhouse at a cost of Rs.200 millions. Consequently, a Summary was initiated for the Chief Secretary which was supported by the Additional Chief Secretary. A note was initiated by the Senior Minister for Establishment of the Task Force on Dairy Science Park which was approved by the Chief Minister on 2-8-2017.

*Objectives*:

A. To attract the stakeholders for active participation in the development process.
B. To spread awareness among the masses and sensitize them to understand the issues of food security and quality.
C. To support utilization of livestock resources for self-employment of the youth.
D. To network the farmers, investors, experts and public sector organizations for joining hands in covering the province into an export base for Halal Meat, milk and eggs in an environment friendly, cost effective way, fulfilling demands of local markets.
E. To utilize the academic, research and development resources of the provincial government and the Dairy Science Park for improvement in livestock farming through quality control standards and certification for biosafety.
F. To provide marketing linkage to the producers, input suppliers and service providers in livestock and allied sectors.

## *2. DSP Board (Development Component)*

Establishment of a Dairy Science Park Board has been agreed by the provincial government on 3-3-2016, for developing the province as a Halal Meat Export Base utilizing the manpower, research and development institutions and unutilized/under-utilized public and private assets through PPP, DSP Veterinary Clinics and Marketing Centers, Agri Marts, franchise developments, commercial companies, etc. Requirement for the Authority comprise: i. KP DSPA Act; ii. Endowment Fund Rs.250 million. A Task Force has been agreed by the Senior Minister Local Government and directed for initiation of a Summary for Approval of the Chief Minister KP. The following guidelines have been provided:

*Principles*

I. The Board will be established as a symbol of hope for the people of KP and the adjoining regions of FATA and Afghanistan.
II. The Board will ensure productive utilization of the human resource and material assets in the best interest of the province and the region through partnership with the public and private sector organizations and individuals.
III. The Board will be a regulatory, financial, development and marketing authority supporting commercialization of livestock and allied sectors in KP.
IV. The Board will work on the basis of self reliance and no repeated funds will be requested for routine operational activities; however, for introduction of special packages and campaigns grants and donations will be accepted.
V. Selection and promotion of staff and fixation of salary will be made on performance basis.
VI. Sales and purchases will be made through local committees and advertisements in the printed and electronic media; local and international; and quality of materials will be preferred for purchases.
VII. Performance audits will be preferred over fiscal audit and liberty will be provided to local committees in financial transactions to avoid unnecessary delays. ·
VIII. Endowment Fund will be utilized up to maximum to support establishment of new entrepreneurs, improvement of existing entrepreneurs, establishment of common facilities centers and launching of feasible and innovative investment models. ·
IX. Information Technologies, business administration, material engineering; environment sciences, satellite information system, etc, will be integrated into the Board's functioning using the national and international linkages.
X. Technical, administrative and financial progress of the Board will be reported monthly and a toll free telephone number will be publicized widely to get advice and inputs from the masses and complaints for any irregularity, for the purpose of transparency and accountability.
XI. Members and staff of the Board will work like a family with equal respect and working space for all.
XII. Awareness campaigns will be held widely to reach the target groups and get them engaged with Dairy Science Park network for participating in the provincial development agenda.

*Strategic Vision*

I. Developing SOPs for producers, processors, marketing partners and service providers and certification for quality assurance
II. Introducing innovations like biogas, solar water pumps, good practices and traceability in the medium sized livestock and poultry farms registered with DSPS through Business Facilitation Centers in the private and public sectors
III. Price of the products of the registered farms will be fixed for the registered farmers in consultation with the price regulating committee of the DSPB.
IV. Financial, technical and marketing support to the youth for self-employment.
V. Facilitation of Corporate and Development Partners of DSPS in horizontal and vertical expansion of business activities
VI. Introduction of Agri-Marts, and a chain of restaurants linked with the registered farmers
VII. Establishment of livestock and poultry breeding farms in partnership with the

public or private organizations/individuals

VIII. Training of entrepreneurs, farm/industry workers, scientists
IX. ISO certification of producers, processors and service providers through DSPS Panel of Experts and Development Partners
X. Financial support to the registered members through Islamic leasing, Mudaraba and Takaful
XI. Competitive Research Grants for: i) developing feasibility models for entrepreneurship; ii) export-oriented/import-substitutional industrial research · Infrastructural support for providing cold chain, transportation, cold storage and air cargo for Halal meat
XII. Legislation for protecting interests of the consumers and members/partners of the Park
XIII. Accepting and donating grants, aids and loans in the interest of the people of KP · Close liaison with the international partners and friendly countries in achieving the goals

*Endowment Fund*

I. Developing feasibility models
II. Facilitating groups of stakeholders in establishing entrepreneurs
III. Input supply and services through Business Facilitation Centers
IV. Replication of prototypes through graduate entrepreneurship
V. Establishing breeding stocks, farming and value addition, renewable energy, housing
VI. Branding of DSP Halal meat and outlets/ export for product marketing
VII. Charity and Bait-ul-mal for the neglected segment of Society
VIII. Fund to support various livestock and poultry development activities including training, market research, upfront procurement for sale to the dairy farmers or dairy industry of containers, coolers, instant chillers, liquid nitrogen flasks and other equipment; to support innovations, the development and promotion of farm products, consumption and export of farm products

***3. University of Veterinary Innovations and Commercialization (UVIC, Academic Component)***

Faculty of Animal Husbandry and Veterinary Sciences (FAHVS), the University of Agriculture Peshawar will be upgraded to UVIC to promote industrial research, quality control, entrepreneurship development, Halal certification, and legislative support to the entrepreneurs. Logistic support will be provided to the DSP Society and DSP Board.

*Research priorities*

- Integration of the teaching and research with the sectoral issues, emerging challenges and needs of the stakeholders
- Development of quality control and certification standards for medium-sized entrepreneurs engaged in livestock and poultry production, processing and marketing; farmers' groups; exporters and corporate sector
- Establishment and collaboration with reference laboratories for quality control and certification of medium sized entrepreneurs, farmers' groups, exporters and corporate sector

- Integrating environmental, ethical and public health concerns into the livestock food value chain
- Introducing innovations like biogas, solar water pumps, good practices and traceability in the medium sized livestock and poultry entrepreneurs
- Analyzing financial, technical and marketing issues in livestock and poultry production practices
- Studies on cost-effectiveness of livestock and poultry entrepreneurship
- Creating a database of Corporate and Development Partners of DSPS for horizontal and vertical expansion in livestock and poultry entrepreneurship
- Analysis of issues faced by livestock and poultry breeding farms in partnership with the public or private organizations/individuals
- Studies on infrastructure availability for, milk/meat/eggs factories, cold chain, transportation, cold storage and air cargo for Halal meat
- Studies on legislative barriers faced by the producers, service providers and consumers of livestock and poultry products
- Studies on the status and identifying success stories in financing of livestock and poultry entrepreneurship under the Islamic perspectives
- Monitoring and facilitating the developments made under the Dairy Science Park through local government and other sponsors

*Structural reforms*

The existing Faculty (FAHVS) will be split into two Faculties of: i) Veterinary Sciences and: ii) Animal Production Sciences and a third; iii) Faculty of Dairy Science Park will be created as follows:

*a. Faculty of Veterinary Sciences*

*Institute of Biosciences:* The existing disciplines and resources available for teaching and research in Anatomy, Physiology and Biochemistry; these facilities would be strengthened for educating the students on the basics of animal production, health care and stress factors hitting these two parameters.

*Institute of Pre-Clinical Sciences*: The existing disciplines and resources available for teaching and research in Pharmacology, Microbiology, Pathology and Parasitology; these facilities would be strengthened for better understanding the disease's patron and role of the pharmaceutical products in improving health and productivity.

*Institute of Clinical Sciences:* The existing disciplines and resources available for teaching and research in Reproduction, Medicine, Surgery and allied disciplines; these facilities would be strengthened for meeting challenges faced by the farming and business communities, generation of self employment and production of hygienic food for the local people and export.

*b. Faculty of Animal Production Sciences*

*Institute of Dairy and Meat Sciences:* The existing Department of Livestock Management will be upgraded to the Institute of Dairy and Meat Sciences and would take care of advances in dairy science, management systems, breeding studies,

management innovations, stress management and farm automations.

*Institute of Animal Nutrition and Feed Sciences:* The existing Department of Animal Nutrition would be upgraded to Institute of Animal Nutrition and would take care of exploring indigenous feed resources, fattening trials, alternate feed resources and industrial application of nutrition sciences.

*Institute of Poultry and Wildlife Sciences:* The existing Department of Poultry Sciences would be upgraded to Institute of Poultry Sciences and would take care of broilers and layers production, quails breeding and farming, turkeys farming, ducks farming, rabbits farming, worm meals studies, enzymes application in poultry feeds and fortified eggs production.

*c. Faculty of Dairy Science Park*

*Department of Products Technology:* The existing Dairy Technology Center will be added with a Meat Technology Center and will be upgraded to the status of Department of Products Technology under the Faculty of Dairy Science Park; responsible for teaching and research on dairy/meat/eggs products, covering nutrients analysis and quality parameters.

*Department of Biorisk Management:* The existing biorisk management initiated through the Zoonosis Information Resource Center and Zoonotic Disease Laboratory sponsored by the Relief International and the Pakistan Biorisk Curriculum sponsored by Sandia National Laboratories USA, will be upgraded into the Department of Biorisk Management under the Faculty of Dairy Science Park. This Department will take care of teaching and research in biorisk management and develop quality standards for livestock and poultry farms, processing facilities and marketing outlets.

*Department of Entrepreneurship and Certification:* This Department will comprise the University Feed Mill, University Dairy Farm, Regi Town Slaughter House under construction by the provincial government and other potential activities of the Faculty and provincial Government/private sector.

The Department will work on teaching, research and development of feasibility models for self-employment of youth and hygienic food production for the people. This Department will collaborate with the Dairy Science Park Society and its registered partners, the sister Departments and private sector/development organizations, to evaluate the registered enterprises for profitability, quality parameters, Halal standards, supporting commercialization and certification.

*d. CPEC Component*

DSP envisions KP and northern areas of Pakistan and the adjoining areas of Afghanistan, Tajikistan, and China into a food export base. For this purpose satellite campuses of the University will be established at Kashgar, Gilgit, Bannu, and Gwadar. Partnership will be established with local investors, corporate farmers and processors to initiate joint ventures.

*Academic Programs*

The existing Faculties will continue the DVM/MSc Hons/PhD and other programs, already in place. New degrees may be introduced as per society needs and availability of resources; Postdoc in various disciplines with sufficient academic standing

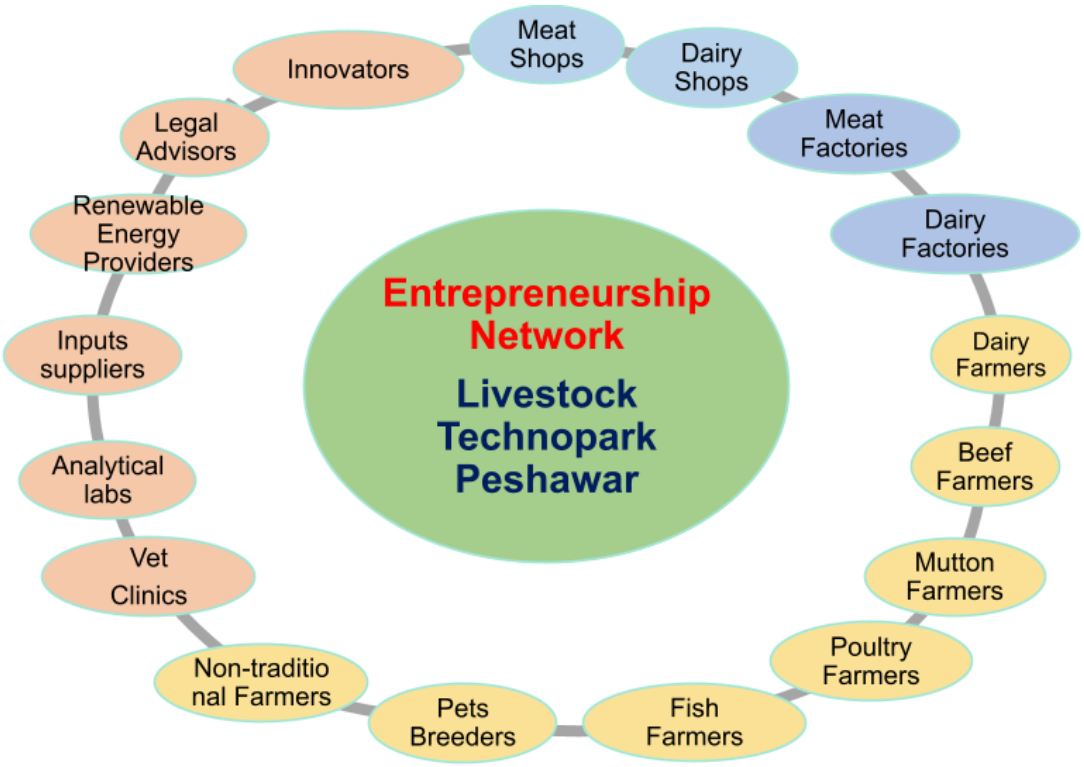
Faculty of Dairy Science Park will introduce M Phil/PhD in Agribusiness (Livestock)/Meat and Dairy Technology/Public Health and Biorisk Management; Diplomas in Livestock Entrepreneurship/Halal Food; Certificate courses; Postdoc in various disciplines with sufficient academic standing

The Academic Programs have been approved by Boards of Studies of Animal Health and Poultry Science Departments and will be submitted to the remaining Boards for approval.

*Cost estimates*

The UVIC project will cost Rs.1 billion, equivalent to US$ 10 million at the exchange rates of 2016, comprising Civil Work, Furniture and Fixture, Equipment, Vehicles, lab supplies, animals, Books, periodicals, software and internet, farm inputs, miscellaneous and and Endowment Fund.

*Entrepreneurship cycle*




23

*Impact*

- Conventional medium-sized livestock and poultry farmers to be converted into viable model enterprises through innovations: 500
- New entrepreneurs to be trained and facilitated: 1000/year
- Consumers and general public to be educated in public health and quality standards, through seminars, workshops, field days, mobile SMS, telemedicine, and mass media: 100,000/year
- Students to get admitted into diplomas and degrees in livestock entrepreneurship, biorisk management, and meat technology: 100/yr 5. Availability of Halal meat, exportable surpluses (at least US$ 5.00 billion) and self employment for the people of KP, FATA, Northern Areas and the adjoining regions of Afghanistan, Tajikistan & China.
- A stable peace and soft image of the people in the region

***Current Status of the Industry - the farmers, protesting for logical price fixation***


***Proposed Status of the Industry - UVIC, the Academic Industry Nexus***

## ***4. The Team***

*List of Executive Members (178)*

*Board of Governors/Executive Body (17)*

1. Chief Patron/President/CEO: Prof M. Subhan Qureshi; qureshi@dairysciencepark.org ; WhatsApp: +92 300 587 7933
2. Vice President (KP): Khanzada Ahmad Kamal; WhatsApp +92 300 276 3636
3. Vice President (Balochistan): Muhammad Azam Kakar,adagul@gmail.com
4. General Secretary: Mr Kamran Khan; khandairiespk@gmail.com
5. Joint Secretary: Dr Muhammad Ullah; WhatsApp +923139221656
6. Secretary Information: Dr Anwar Shah; WhatsApp +923341551887
7. Managing Director: Engr Irfan ul Haq Qureshi; i.quraysh@gmail.com
8. CTO: Prof Sarzamin Khan, dr.zaminaup@gmail.com
9. CFO: Prof Umer Sadique, druskhattak@yahoo.com
10. Member: Prof Ghazala Yasmeen, WhatsApp: ghazala_nizam2006@yahoo.com
11. Member: Mr. Zafar Hussain Paracha, sendawaiszafar@gmail.com
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13. Member: Dr Rajwali Khan; rajwalik@gmail.com
14. Member: Muhammad Asif Khan Awan, WhatsApp +92 0333 927 9626
15. Legal Advisor: Adv Murtaza Qureshi; WhatsApp: 0345 908 8522
16. Media Advisor, Mr Fayaz Ali Noor
17. Director Admin: Dr Samina Naz; pakeconomist@hotmail.com

**General Body**

*Country Representatives/Focal Persons (11)*

1. S Shafiullah Khan, FP Australia, avas102@yahoo.com
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4. Tawheed Ali, FP Afghanistan, tawheedn@gmail.com
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9. Dr Irfan Maqsood, FP Iran, WhatsApp: +989196161745
10. Syed Ahmed Hasnain, Qatar,
11. Riaz Hussain, FP Canada, riazh53@hotmail.com

*Advisory Panel (12)*

1. Inayatullah Khan, Ex-Senior Minister LG, KP, inayatullahnwfp@gmail.com
2. Mr Arif Yousaf, Ex-Convener SDGs Task Force/Ex-Member Provincial Assembly Khyber Pakhtunkhwa; WhasApp: +923008582182
3. Syed Sardar Bacha, PaK Youth Org/Adviser Youth Affairs
4. Javed Khattak SMEs' development, javedk@smeda.org.pk
5. Mohibullah Khan, Minister for Agriculture KP, Mobile: +92 333 852 3333

6. Khan Bahadur Marwat, Ex-VC SBBU Sheringal, kbmarwat@hotmail.com
7. Ms Nasreen Khattak Ex-MPA, parveenkhan234@gmail.com
8. Khalid Khan, Higher Education, khalidsa02@gmail.com
9. Wajid HS Pirzada, Expert International Trade
10. Nasir Shah, Higher Education, nrshah@hec.gov.pk
11. Dr Muhammad Sarwar, Ex VC Gomal University
12. Prof Ibrahim Soliman, Zagazig Univ, Egypt

*Working Group (10)*

1. Alladdad Khan, Ext & Comm
2. Engr. Inam Ullah Wali (Solar Energy)
3. Muhammad Muneeb (Food S&T)
4. Engr. Raheem Ullah Khan (Solar Energy)
5. Dr. Naseer Ahmad (Poultry Sci)
6. Dr. Muhammad Bilal Islam (Poultry Sci)
7. Rafiullah Khan (Poultry Sci)
8. Dr. Sher Bahadar Khan (Biorisk Management)
9. Engr. Samia Subhan Qureshi (Solar Energy)
10. Engr. Zeeshan Saeed Shah (Solar Energy)

*Experts Panel – General (10)*

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6. Asad Sultan Poultry Nutrition, asadzia2003@yahoo.com
7. Zubair Mughal, Islamic Financing, zubair.mughal@halalrc.org
8. Farhan Anwar Khan, Pathology, drfarhananwar2003@yahoo.com
9. Farooq Shah NIM/PARD/HRD, mr.farooqshah@gmail.com
10. Amjad Usman, Entomology, amjadusman@aup.edu.pk

*Experts Panel – Business Incubation (10)*

1. Arshad Hashmi, Business Incubation; hashmi.arshad@gmail.com
2. Rashid Aman, Entrepreneurship; mrashid@smeda.org.pk
3. Sadia Qureshi, Halal Food; ssqureshi.arabic@gmail.com
4. Shakir Ullah, Sheep Entrepreneurship; drshakirgcvs@gmail.com
5. Peter Wynn, Australia; pwynn@csu.edu.au
6. Shakoor Ahmad, QC; shakoor.ahmad@aup.edu.pk
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10. Asghar Khan, Dubai; asgharkhan_n@yahoo.com

*Experts Panel – One Health (10)*

1. Dr Alamdar Hussain Malik, One Health and Policies

2. KB Mirbahar, SBBUVAS Sakrand, kbmirbahar@gmail.com
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6. Melissa Finley, SNL, Biorisk Management, mfinley@sandia.gov
7. Arshad Zahoor, Public Health, arshad@aup.edu.pk
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10. Sania Qureshi, Secretary, saniasq@gmail.com; Webpage

*Experts Panel – Farming Innovation (31)*

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6. Sontakke Umesh Balaji, Animal Nutrition, umeshndri@gmail.com
7. Munibullah Yousafzai, PMAS-UA, Epidemiology, drmunib15@gmail.com
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14. Nazir Ahmad Khan, Animal Nutrition, nza94@hotmail.com
15. Prof Abdur Rahman, Meat Sci, abdur_rahman@aup.edu.pk
16. Zahidullah Shinwari KPCCI, zhdshinwari@gmail.com
17. Sadeeq ur Rahman, Microbiology (AWKUM), sadeeq@awkum.edu.pk
18. Syed Jawad Hussain Kazmi, LEAP, kazmijawad@yahoo.com
19. Abdul Qadoos Khan, Business Recorder, aqkhan69@hotmail.com
20. Tahir Usman, Animal Breeding and Genetics (AWKUM), tahircau@gmail.com
21. Saadia Hanif, Farm Dynamics Pakistan, saadiahanif9@yahoo.com
22. Maryam Hussain, Meat Production, maryamhussain05@gmail.com
23. Sajidullah Khan, Remote Sensing, Diagnostic Imaging (CECOS Univ), sajidullah@cecos.edu.pk
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25. Ms Surayya Shahab, KP LFWA, WhatsApp: +923118181025
26. Ms Hasil Dana, Horticulturist, hasildana51@gmail.com
27. Dr Z Fatima Rizvi, Innovations and Women Development, VC IISAT Gujranwala, zarrinfatimarizvi@gmail.com
28. Engr Aemal Ahmad, Community Services, aemalahmad@hotmail.com
29. Ishrat Roomi, Eco-Security
30. Qasim Ali, IT, info@wqsoftwares.com

*Internee*

1. Nazakatul Hassan, Nutri Max (Flavored Milk), 2020-dvmje-055@uvas.edu.pk

*DSP Balochistan Chapter (DSP-BC, 35)*

*Advisory Panel – DSP-BC*

1. Mr Badruddin Kakar SVP QCCI
2. Dr Shafiq ur Rahman, VC,
3. Mr Dostain K Jamaldini LDD
4. Dr M Azam Kakar Central Vice President DSP
5. Dr Tariq Kiani CASVAB
6. Prof M Subhan Qureshi, President DSP
7. Shah Sarwar Agha QCCI
8. Mr Shah Sarwar Agha, QCCI
9. Executive Committee – DSP-BC
10. Central Vice President DSP: Dr Muhammad Azam Kakar
11. President: Ms Rubina Saeed Shahwani
12. Secretary: Dr Fayaz Ahmad
13. Member: Qazi Ayaz, Talha Enterprise
14. Member: Mr Shah Sarwar Agha, QCCI
15. Member: Waheed Noor BU
16. Member:Dr Naeem Shahwani, BUITMS
17. Member:Dr Nasrullah Bangalzai, LUAWMS
18. Member:Dr Zubia Masood SBKWU

*Executive Committee – DSP-BC*

1. Central Vice President DSP: Dr Muhammad Azam Kakar
2. President: Ms Rubina Saeed Shahwani
3. Secretary: Dr Fayaz Ahmad
4. Member: Qazi Ayaz, Talha Enterprise
5. Member: Mr Shah Sarwar Agha, QCCI
6. Member: Waheed Noor BU
7. Member:Dr Naeem Shahwani, BUITMS
8. Member:Dr Nasrullah Bangalzai, LUAWMS
9. Member:Dr Zubia Masood SBKWU

*Operational Members – DSP-BC*

1. Dr Shahzad N Jadoon Alltech
2. Dr Shabbir Cattlekit-PATTA
3. Mr Abdul Qayyom, International Trade Center
4. Mr Juma Khan QCCI
5. Mr Akhtar Kakar QCCI
6. Mr Anwar Achakzai, Farming
7. Raja Lateef
8. Mr Shakoor Ahmad, SMEDA

*Dairy Science Park Southern Punjab Chapter (DSP-SP, 18)*

*Executive Committee*

1. Sardar Ahmad Mujtaba Khan Rind, Chief of Royal Taman Rind, President
2. Prof. Dr. Mussarat Abbas, ABG, IUB, Vice President
3. Dr Mushtaq Gondal, ICE&E, CUVAS, Secretary
4. Prof Muhammad Khalid Mansoor, Dean FVAS, IUB, Coordinator National Linkages
5. Dr Qudratullah, HOD CMS & Therio, CUVAS, Coordinator Animal Health
6. Dr Zafar Siddiqui, ISRA University, Coordinator Innovations and Commercialization
7. Prof EB Marghazani, Camel Assoc Pak, Coordinator Camels Entrepreneurship
8. Mr Anwar Saleem Hashmi, SECure All Pakistan, Coordinator G-Fund
9. Prof Shazia Anjum IUB, Coordinator Herbal Medicinal Industry
10. Adv Muhammad Akram Somoro, Coordinator Legal Services
11. Mr Yaseem Ayaz Shahani DG Khan, Member
12. Dr Sohail Sajid, Parasitologist, UAF, Member
13. Dr Ali Raza, IUB, Member
14. Prof Riaz Hussain, Pathologist, IUB, Member
15. Ch Muhammad Ismail, Ex Officer – Pak Rangers and Agripreneur, Member
16. Prof M Subhan Qureshi, President DSP, Observer
17. Mr Kamran Akram, GS, DSP, Observer
18. Prof Azam Kakar, VP, DSP Balochistan, Observer

*DSP Egypt Chapter – Executive Committee (13)*

1. Prof. Dr. Saber Abd-Allah, Focal Point DSP (Egypt), Beni-Suef University
2. Mr Abdur Rahman Ilyas, Advisor to the President, ASRT
3. Dr Amir Faroukh Abdelkhalik, ASRT
4. Prof. Dr. Mohamed Ahmed Mohamed, Tanta University
5. Prof.Dr. Ibrahim Soliman, Zagazig University
6. Prof. Dr. Khalid Hafez. Cairo University
7. Prof Dr Rabie Hasaan Fayed, Cairo University
8. Dr. Mohamed Fathi Cairo University
9. Prof. Dr. Hassan A. Hussein, Asuit University
10. Dr. Ahmed Saad Ahmed, Qena University
11. Ragab Hassan MohamedAswan University
12. Dr. Magdi Elgbobashi, Quality Assurance Consultant, Cairo, Egypt.
13. Dr. Diya'ud-Din Abdel Moemen El-Badry Aly, Agriculture Research Centre, Giza

*Other*:

1. BRM Alumni (58)
2. Participants-list-DSP 2017 Konya-Sütçülük-Konferansına-Katılanların-Listesi (135)
3. Working Group of Task Force on DSP (32)
4. Advocacy Forum DSP-Notification (16)
5. Notification-Advocacy-Forum-Corrigendum (2)

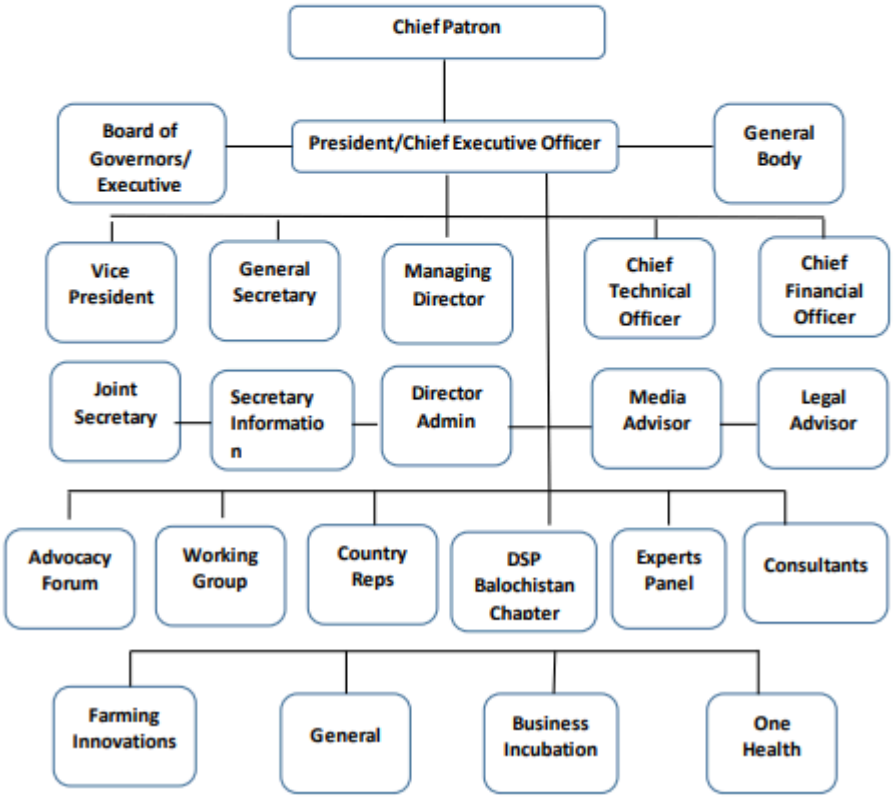
DAIRY SCIENCE PARK

## Organizational structure

Dairy Science Park, Room 3, Floor 3, Azam Tower, Arbab Road Stop

University Road, Peshawar

www.dairysciencepark.org.pk



## ***5. Funding Status***

The Dairy Science Park (DSP) Society has an office at 23-A, Royal Dairies, Industrial Estate, Hayatabad, Peshawar-25000, Pakistan and Mr Kamran Akram, CEO Royal Dairies has been assisting the Society as General Secretary . Engr Irfan Qureshi, Managing Director has been financing the website of the DSP. Prof M Subhan Qureshi, President DSP has been taking care of the registration process of the Society and contacts potential partners for registration and linkages with the national and international partners.

The International Workshop series is sponsored through HEC/PSF grants, industrial exhibition of private companies and registration. The tours to Amsterdam, Dubai and other destinations, for formulating Biorisk Management Initiative are sponsored by Sandia National Laboratory USA.

The Senior Minister LGE&RD has approved a proposal of the DSP for establishing a model slaughter house valuing Rs.200 million at Peshawar. The DSP Academic Component and DSP Authority valuing Rs.500 million were agreed in principle by the Senior Minister KP.

Other development partners and international agencies are supporting the activities of the Dairy Science Park on case to case basis and the Society is looking for more partnership to achieve the greater goals of generating self employment for the youth and hygienic food production for the people of the Region in partnership with the United Nations' SDGs.

## ***6, Publications***

*Conference Proceedings*

*Biennial Series of International Conferences and Industrial Exhibitions*

- Proc DSP ! - 2011 Peshawar; DOI: 10.13140/RG.2.2.31757.84966
- Proc DSP II - 2013 Peshawar; DOI: 10.13140/RG.2.2.14980.63366
- Proc DSP III – 2015 Peshawar; DOI: 10.13140/RG.2.2.15057.51048
- Proc DSP IV - 2017 Konya: DOI: 10.13140/RG.2.2.26724.68489
- Proc – DSP V - 2019 Quetta
- Proc DSP VI – 2023 Bahawalpur

*International Solar Expo and Conference*

- Proc ISE 2024

*National Eco-Security Congresses*

- *2022 NESS Congress*
- *2023 NESS Congress*
- 2024 NESS Congress

*One Health Conference Series*

- One Health Conf 2023
- One Health Conf 2024
- Proc One Health Conf III – 2025

*UN Consultancy Reports*

- FAO KP Livestock Action Plan on Good Governance through Livestock Technopark Peshawar – 2019. FAO-UN/UN-SDG Access, DOI: 10.13140/RG.2.2.14761.92006
- Baluchistan Livestock Breeding Policy 2022 – M Subhan Qureshi – ITC-UN; FAO Access; DOI: 10.13140/RG.2.2.32377.99682

*Special Paper/Books/Conference Proceedings*

- BRM-DVM-Curriculum-Integration-Package
- DSP-Sandia BRM Workshop at Colombo
- Reproductive Physiology of Domestic Animals – M S Qureshi
- The Purpose of Life – M S Qureshi
- Australian Muslim Times – M S Qureshi
- Review: DSP connecting Rumi, Iqbal, Tolerance and SDGs
- Presentation: The AI Revolution of 1930s; DOI: 10.13140/RG.2.2.22305.79206
- Road-map towards knowledge based economy – DOI: 10.13140/RG.2.2.29069.10720

*Newsletters Dairy Science Park*

- DSP-NL-Mar-2015
- DSP-NL-June-2015
- DSP-NL-Sep-2015
- DSP-NL-Dec-2015

*Meetings*

1. 1st Meeting Board of Governors, 15th July, 2015
2. 2nd Meeting Board of Governors, 4th January, 2016
3. 3rd Meeting Board of Governors, 15th July, 2016
4. Minutes of meeting for organising DSP VI - 2023 Bahawalpur
4. 4th Meeting Board of Governors and General Body, 30 April, 2026

## 7. Dairy Science Park – Entrepreneurship Roadmap

# Dairy Science Park – Entrepreneurship Development Roadmap

Prof M Subhan Qureshi
President Dairy Science Park
www.dairysciencepark.org
drmsqureshi@gmail.com
WhatsApp:+923005877933

Dairy Science Park - Blueprint 1

Dairy Science Park - Blueprint 1

## The Issues

**Total value Rs.1000 b**
**An meat prod Rs.200 b**

- Entrepreneurship contribution???
- Hygienic food production ????

## The Issues

- *Animal transportation ?*
- *Products processing ?*
- *Formal investment ?*

- Traceability of products ???
- QC certification ????

3

## Institutional focus

- Livestock Extension, health coverage
- Livestock Research, vaccine and diagnosis
- Livestock Education, veterinary medicine
- Agric Extension/Research, Crops Production & Mngt

## The Issues

- Deputy Commissioner, price capping, no QC
- Legal courts, price capping, no QC
- SMEDA, little attempts
- KPCCI, low priority
- Public health, low priority
- ORIC Offices of Universities, underutilized

- **Entrepreneurship/exports, missing**
- **Hygienic/Halal concepts, missing**
- **QC Control/Traceability, missing**

4

# Dairy Science Park The Intervention

- Registered as a Society under Societies' Registration Act XXI of 1860 (Reg No.4582/5/8589 dated 2-7-2015) by Government of Khyber Pakhtunkhwa
- Accepted by KP Chamber of Commerce and Industries as a Corporate Member.
- Accepted by the United Nations as SDG Action 9671, notified at https://sustainabledevelopment.un.org/partnership/?p=9671.
- DSP is taking care of Sustainable Development under:
  - SDG 2, covering production of milk, meat and milk for local consumption;
  - 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 and;
  - SDG 16, ensuring end of conflict among stakeholders in the private and public sectors

5

# The Dairy Science Park Approach

*Academia – Industry – Government Intervention*


6

# 1. International Conferences and Industrial Exhibitions Series

7

DSP I - 2011 Peshawar



Mr Zahid Shinwari President KPCCI, Mr Zafar Paracha, Prof M Subhan Qureshi, Prof Umer Sadiqui and Mithat Direk (Turkey) at Industrial Exhibition of DSP 2013

DSP-II - 2013 Peshawar

8

DSP III - 2015 Peshawar

DSP-IV - 2017 Konya



DSP V - 2019 Quetta + BLE

DSP Quetta established at QCCI

# 2. Biorisk Management Workshops Series

11

DSP BRM I - 2015 Amsterdam

**2015 - Amsterdam**

**Sandia National Laboratory USDS agreed on Biorisk Management Collaboration**

DSP BRM II – 2016 Dubai

**Sandia National Laboratory-Dairy Science Park BRM Workshop**

12

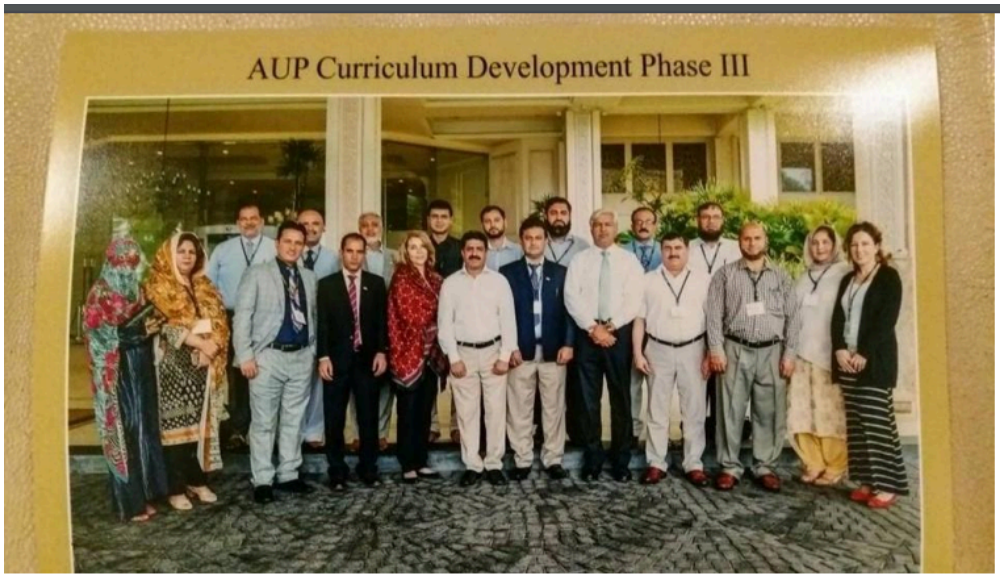
DSP BRM III - 2016 Bangkok

**SNL-DSP Workshop on BRM Curriculum Development**

DSP BRM IV - 2017 Phuket

**SNL-DSP BRM Workshop on public health awareness**

13




DSP BRM V - 2017 Colombo

**SNL-DSP Workshop on BRM integration into DVM Curriculum**

DSP BRM VI - 2017 Konya

**DSP IV integrating Biorisk Management into conference theme**

14

DSP BRM VII - 2018
Amman
**SNL-DSP Workshop on BRM techniques in Research Methodologies**

DSP BRM VIII - 2019 Dubai
**Top Management trained in on Implementation Strategy**

15

# 3. Entrepreneurship Development through Academia Industries Linkages

16

2014
Minister Agric inaugurated
Livestock Desk at KPCCI

2014: Univ Feed Mill functionalized

17

## DSP introduced farming innovations

- Stock arranged at Chamkani DSP Center
- Introduced at dairy and meat farms
- Connected with livestock markets
- Displayed at Agric Univ Vet Clinic

18

18


**Dairy entrepreneurship models**

- Dairy/meat Farming — Elite animals production
- Feed production — Silage making
- Pharmaceuticals prod — Training and consultancy
- Diagnostic labs — Clinics
- Dairy Processing — Products marking

19

UAP developed Quails entrepreneurship Models

GreenWend Solar Energy Solutions developed solar incubators models


## Poultry Entrepreneurship models

Broiler farming Breeding Inputs supplies
Meat processing Biotech Products Diagnostic/QC labs
Packaging/marketing

21

## *Jan Meat Shop*

## *Certified in QC for price fixation exercise*

DAIRY SCIENCE PARK
dsp
Certified Quality

22


Farmers
BEEF MEATLOAF
CHICKEN BOLOGNA
CHICKEN SAUSAGE
SMOKED CHICKEN
Farmers
The Sausage Company
DAIRY SCIENCE PARK
dsp
Certified Quality


Peshawar Meat introduced
DAIRY SCIENCE PARK
dsp
Certified Quality
PESHAWAR MEAT
Produced on
30 APR 2017
THE PIONEER MEAT FACTORY
IN THE REGION
CERTIFIED
• Hygienic & Halal Meat
• Quality Ensured at Each Stage of Processing
Economy Beef


Best Teachers Award - Socio Economic Impact

Raised confidence Applied Research Quality Control
Entrepreneurship dev Exportable surpluses

25


# The Beacon of Hope

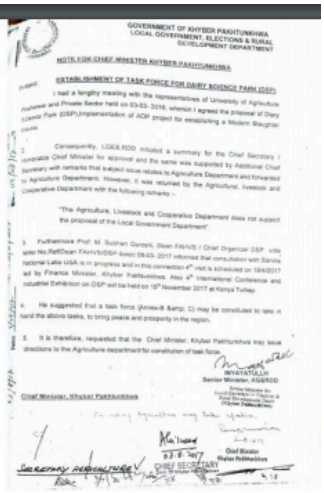
## Kamran Khan

DAIRY SCIENCE PARK
dsp
Certified Quality

26

# 4. Policy Dialogue

27

GOVERNMENT OF KHYBER PAKHTUNKHWA
LOCAL GOVERNMENT, ELECTIONS & RURAL DEVELOPMENT DEPARTMENT

NOTE FOR CHIEF MINISTER KHYBER PAKHTUNKHWA

ESTABLISHMENT OF TASK FORCE FOR DAIRY SCIENCE PARK (DSP)

- **Minister LGE&RD** chaired a high level meeting and agreed on establishing Task Force on Dairy Science Park; approved Rs.200 m for Slaughter-house
- **Additional Chief Secretary** appreciated DSP as "the innovative idea of the LG regarding establishment of Dairy Science Park at Peshawar to provide hygienic food production to the whole province
- **Chief Minister KP** approved Task Force for DSP on 2-8-2018; notification pending at Agriculture Department

28

**2016**

MoU on Collaborative BRM Initiative between KMU, UAP, DSP and HEC

29

## FAO-UN KP Livestock Action Plan 2019 submitted

Establishing Gomal Technopark agreed at DI Khan
Establishing Livestock Business Facilitation Centers agreed at Divisional Headquarters

30

# Guidelines for procurement and sales rules at FAO KP Livestock Action Plan 2019

1. The Rules must be simple, transparent and must ensure quick delivery of goods.
2. The purchase committee for a functioning Unit of an organization shall comprise 2 senior officers and a person from the industry/civil society, with delegation of powers to purchase the desired items.
3. The purchase committee for an Organization would comprise three senior most officer one member of industry/civil society and one independent auditor.
4. An Endowment Fund would be available in an authorized bank account.
5. Three quotation may be obtained, if required.
6. The Rules must be followed while reviewing, ordering, obtaining, and paying for goods/services.
7. Checkpoints/steps must be minimum to avoid the complexity of the purchase process.
8. The Funds available to the organization shall be non-lapsable.
9. The bill shall be passed by the chairman of the committee within 3 days in case of a Unit and within 10 days in case of an Organization.
10. Transparency of the process shall be monitored by an M&E Committee. Accessibility of records would be ensured to the relevant accountability organization. No member of the purchase committee would be harassed by the audit parties, NAB or senior officials/elected peoples' representatives.

31

Livestock Farmers Welfare Association was the real stakeholder of Policy Dialogue under **FAO KP Action Plan 2019**

**FAO KP Livestock Action Plan 2019 recommended establishment of Livestock Technopark Peshawar as an autonomous authority with legislative, regulatory, financial and administrative powers to protect interests of all the stakeholders across the Livestock Value Chain in line with UN SDGs 2, 3, 5, 7, 8 and 16.**

32

***Livestock Technopark Quetta proposed under ITC-UN Consultancy (Qureshi 2022)***



## Establishing Livestock Technopark - 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, poultry and fish production, processing, marketing, quality control, diagnostics, veterinary clinical, processing and biotech products, marketing and legislative services, engaging university student and graduates; as source of decent employment and exportable surpluses; engaging SMEDA in entrepreneurship development
- Improving/establishing, slaughterhouses and meat processing facilities through joint ventures or public/private sector investment.

## Establishing Livestock Technopark - Functions (contd)

- Establishing cold chain for transportation of milk, meat and by products across district, provincial and national/international borders for meeting local and international marketing requirements and standards.
- Development of 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 analyzed 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 livestock food value chain and exemption of the registered entrepreneurs and institutional units from all type of taxations.

35

## Establishing Livestock Technopark - Functions (contd)

- Establishing common facilities centers 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 disease 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/wool production, processing and marketing and providing feedback to administrative and legislative bodies for taking corrective measures.

36

Signed MoU with Chinese Academy of Agric Science

Visited Great Mosque of Xi'an


**Dairy Science Park - China Collaboration**

Prof Qureshi DSP attended 7th Int Symp Integ Zool, 25-28 Aug 2015. ISZS, Xi'an

37

Zafar Parach DSP delegate visited Tashkurgan, China for exploring self-employment and hygienic food production in the CPEC Region.

DSP Delegates discussed scientific and business collaboration with St Fulin Group Co Ltd, China during the CPEC Summit 2016 held at Pak-China Friendship Center, Islamabad.

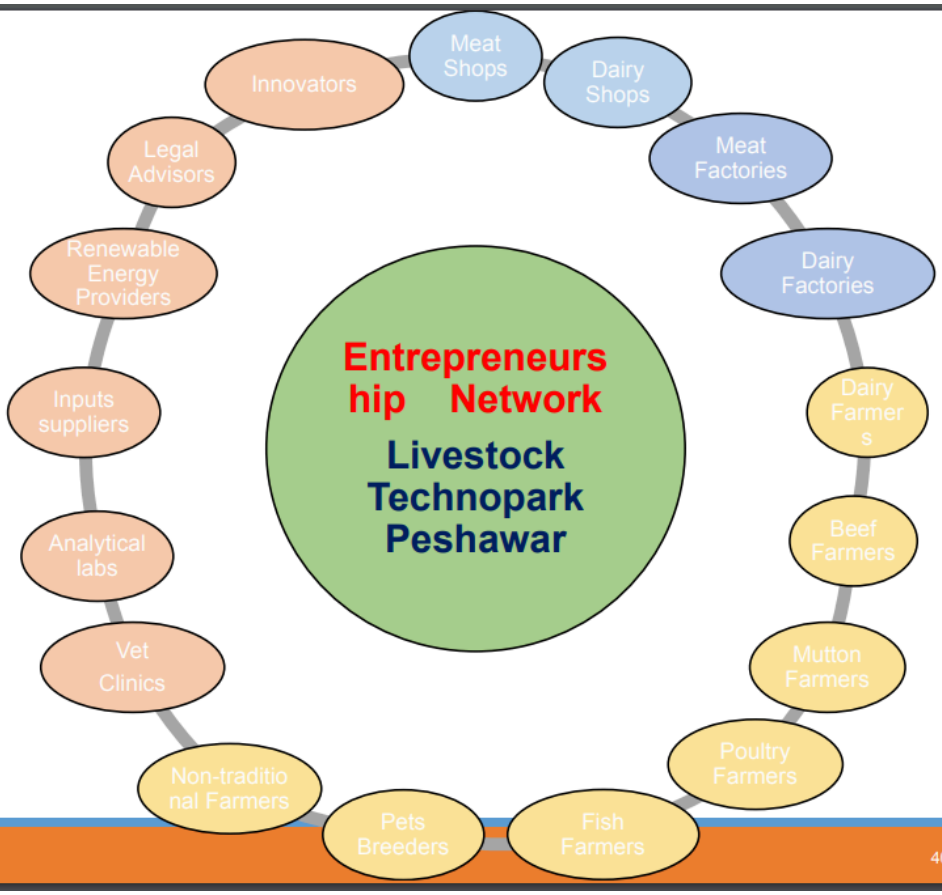

Irfan Qureshi DSP delegate attended Seminar on agricultural industrialization for Asian Countries Agric Mangt Instt Oct 2016

**Dairy Science Park - China Collaboration**

38

# 5. Investment Proposal

39




40

## Livestock Entrepreneurship Development Centers (LEDC)

- LEDCs would be established at PSOs or private firms and run as joint ventures through management committees under an LTQ Endowment Fund.
- LEDCs would support farmers to access farm inputs, products sale, training and regulatory support. LEDC would be run as PPP-based joint ventures.
- The Centres would be providing facilities of establishing model farming, milk/meat shops, products processing factories, diagnostic labs and marketing and allied facilities.
- Outgoing graduates at the universities would be facilitated for internship and enthusiastic faculty members would be facilitated in demonstrating feasible entrepreneurship models across livestock value chains.
- Specialized facilities would be provided like mini feed mills, mini slaughterhouses, mini dairy factories, hatchery services to the farmers for producing fancy birds.
- 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.

41


42

## *8. Livestock Entrepreneurship Development Center Bawalpur*


### The livestock resourcebase

- Livestock sector contributes 11% to the GDP in Pakistan.
- The development approach in the Cholistan Region has been Laissez-faire type.
- Transactions between private groups of people are free from any form of economic interventionism deriving from special interest groups (Farooq et al, 2007).
- A notable portion of the livestock population of Pakistan has been present in the desert regions where herders have got no alternate source of livelihood
- Cholistan Desert located in the southern Punjab spread over 26,100 sq km.
- The farming system has been practised under pastoral and agro-pastoral systems (Iqbal et al 2000).
- The average distance of livestock farmers from:
  - milk collection centres 19.44
  - veterinary dispensaries 36.07
  - veterinary medical store 40.07 and
  - livestock market 46.25 km.

2

## Livestock production and entrepreneurship issues

- Livestock heads per herd:
  - Cattle 51
  - Camel 4-5
  - sheep 61
  - goats 19
- Livestock provide livelihood support to the local community through sale of:
  - adult males of small ruminants
  - young large ruminants
  - dairy products.
- The entrepreneurship potential of livestock value chain is impeded by:
  - low human capital
  - little infrastructural facilities
  - livestock production in isolation from various amenities necessary for life and business

(Farooq et al, 2007)



## LEDC Bahawalpur

1. Livestock Entrepreneurship Development Centre (LEDC) would be established in Bahawalpur as a joint venture of the Islamia University of Bahawalpur, Dairy Science Park, SECure All Pakistan, Camel Association of Pakistan and a private partner donated about 125 acres of land, Mr Mujtaba Rind and others.
2. LEDC would be run through a local committee under Endowment Fund (EF).
3. LEDC will provide the stakeholders:
   a. farmers' access to business incubation through postgraduate research
   b. development of entrepreneurship models
   c. training
   d. farm inputs, product sales
   e. products processing through a meat and a dairy factory
   f. regulatory support
   g. facilitating establishment of model farming, milk/meat shops, products processing factories, diagnostic labs, marketing and allied facilities

## Endowment Fund

- An EF would be established through provincial/federal/donors grants for developing entrepreneurship models under the LEDC..
- The private sector would offer their land, animals, building and other assets for a period of at least 15 years with investment by LECD and operational arrangements by pvt partner. Sardar Mujtaba Rind has agreed for partnership.
- The fund would be used for entrepreneurship development, for facilities required for establishing common facilities/processing units at various locations.
- Net profit for each project will be shared on periodical basis as:
  - 34% would be reserved for the Gift Fund for creating an income source for the extremely vulnerable populations.
  - 28% for the private partner providing land, animals, clinic, factory, meat/milk shop and operational arrangements.
  - 28% will be paid to the relevant faculty members, staff and students involved in HHP.
  - 2.5% each will be paid to DSP, CAP, SAP and IUB.

5

## Herd Health Program

- Herd Health Program (HHP) teams would be constituted to:
  - engage the postgraduate students and faculty members of IUB;
  - improve product quality and;
  - to reduce the per unit productivity cost through improved practices.
- Entrepreneurship models would be developed engaging the postgraduate students at the proposed LEDC jointly by the farmers, processors, universities and government officials through business incubation.
- Facilities would be provided for:
  - laboratory diagnosis of various livestock and poultry diseases
  - applied research will be conducted for postgraduate thesis on animal health and productivity issues through collaboration with sister organisations and Herd Health Program teams.

6

## Animal Health and Production

- Faculty of Animal and Veterinary Sciences IUB will help in improving health and productivity of livestock animals targeted at:
  - improved productivity
  - reduced cost per unit productivity
  - Improve products quality
- Laboratory and clinical facilities will be provided for:
  - preventive medicine
  - disease diagnosis and treatment
  - research on emerging diseases
  - feed analysis and toxicology
  - genetic improvement, fertility management, artificial insemination
  - molecular techniques in animal health and productivity

7

## Meat and Dairy Technology

- Cholistan district is rich in livestock resources however, resource management is poor resulting in prevalence of poverty in the region.
- Processing of meat and milk is at negligible level preventing preservation of the high value foods and reduced income levels of farmers.
- Establishment of such factories would boost up development and replication of interlinked entrepreneurship models in:
  - livestock and poultry production, marketing, quality control
  - diagnostics and veterinary clinical services
  - production of livestock and biotech products
  - marketing and legislative services
- Engagement of university graduates would be used as a source of generation of decent employment and exportable surpluses.

8

## Halal and Hygienic standards

- The Departments of Shariah and Law would help in defining the Halal standards
- Relevant Departments would be involved in developing business modules for entrepreneurship models working across the Livestock/Camel Value Chain.
- The Departments of Biochemistry, Biotechnology, Bioinformatics, Botany and Zoology will place their students at LEDC for pursuing relevant research and providing solutions to the emerging issues.
- The Cholistan Institute of Desert Studies will work on the genetics of medicinal plants and identification of candidate plants

9

## Outcomes

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

● Applied research in livestock and poultry science to be published in high ranking impact factor journals, providing social and economic benefits.

● Well-educated, trained and skilled men and women graduates belonging to different parts of the country who may lead the industry through establishment of an entrepreneurial network of model farms, milk/meat shops, products processing factories, diagnostic labs, training and marketing centres and allied facilities.having visible impact on the national economy.

● Availability of quality certified and traceable meat, milk, eggs and other animal products in the market at local, provincial and national level and export export market, especially the Middle East in coordination with BCCI.

● The vulnerable family system in the region through the Gift Fund, empowering women and men through enhanced income, improved education for kids, good quality diets and a better living standard for everyone in the family. Such families would be facilitated to establish their own business.

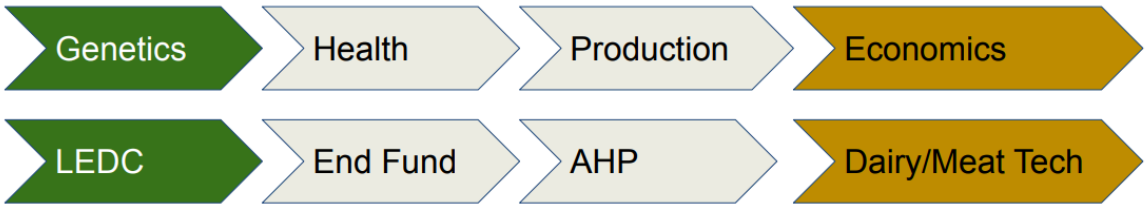
10

## The Roadmap

*Elite Cholistani cows*

*Camel facing water shortage*

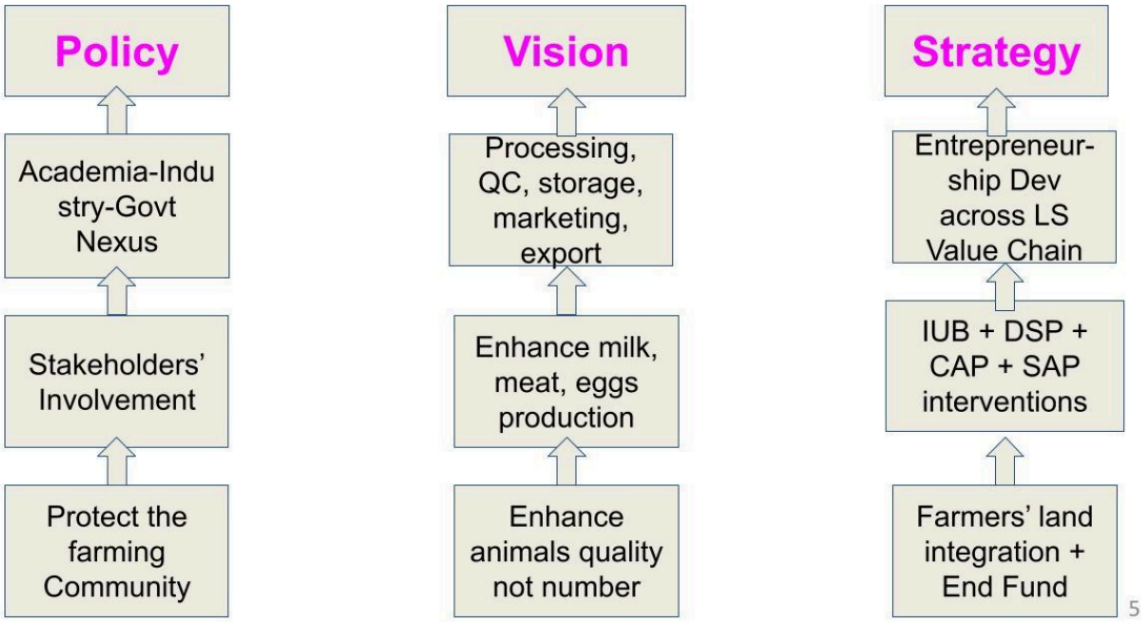
*Cholistani Sheep and Goats*




*Picture courtesy: cattle: Farooq et al 2010 ; camel: Tribune 2018 ; sheep: APP 2021*

11

## Intervention strategy




5

## Good Governance Model
## Academia-Industries-Government Nexus

- Developing SOPs
- Entrepreneurship models

- Exploring sponsorship/land/ market
- Identifying vulnerables

- Developing farming systems
- Collaborating camel dev orgs

- Hosting LEDC
- Outreach services
- Establishing model entrepresizes

DAIRY SCIENCE PARK

SECure All Pakistan Societal Resilience

`(Picture Courtesy: APP 2021)

6

## Cost Estimate (Rs million)

| S No | Component | End Fund | Non-lapsable Development Grant | Total |
|---|---|---|---|---|
| 1 | HH Program | 10 | 0 | 10 |
| 2 | Animal H&P | 10 | 0 | 10 |
| 3 | Meat & Dairy Tech | 10 | 10 | 20 |
| 4 | HH Standards | 5 | 0 | 5 |
| 5 | Halal Meat Factory | 15 | 10 | 25 |
| 6 | Mini Feed Mill | 10 | 10 | 20 |
| 7 | Entrepreneurship Dev | 10 | 0 | 10 |
| | Total | 70 | 30 | 100 |

14

# References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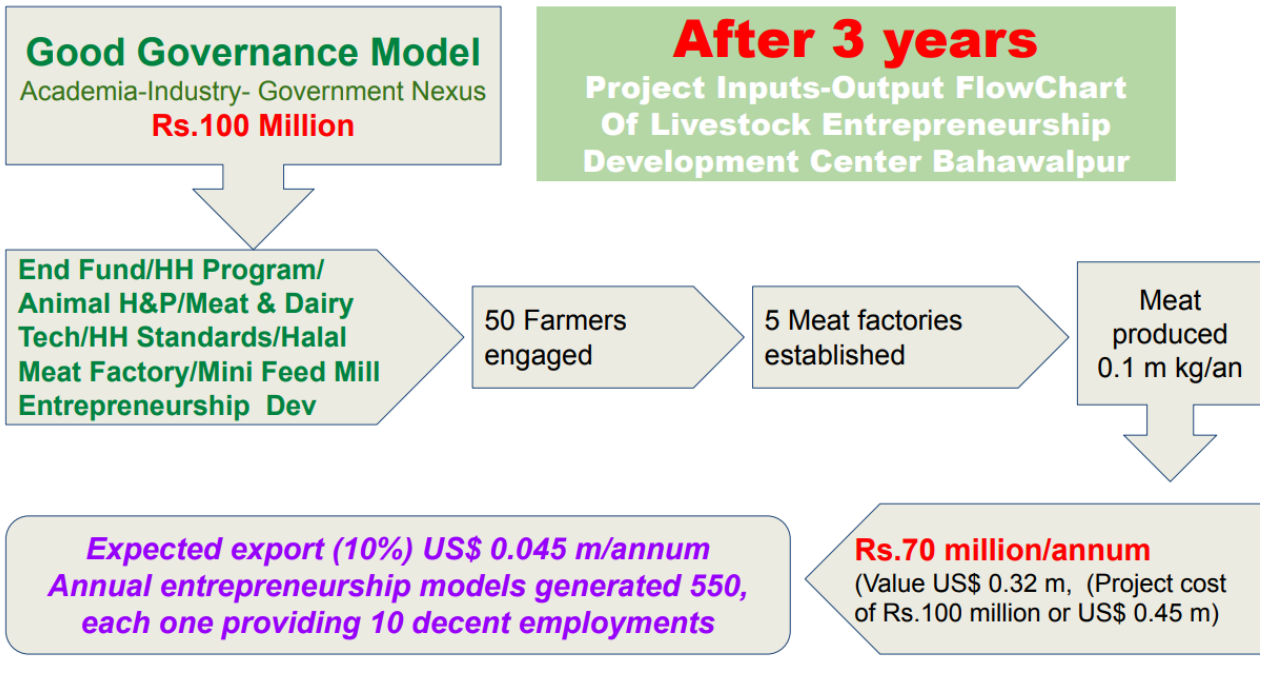

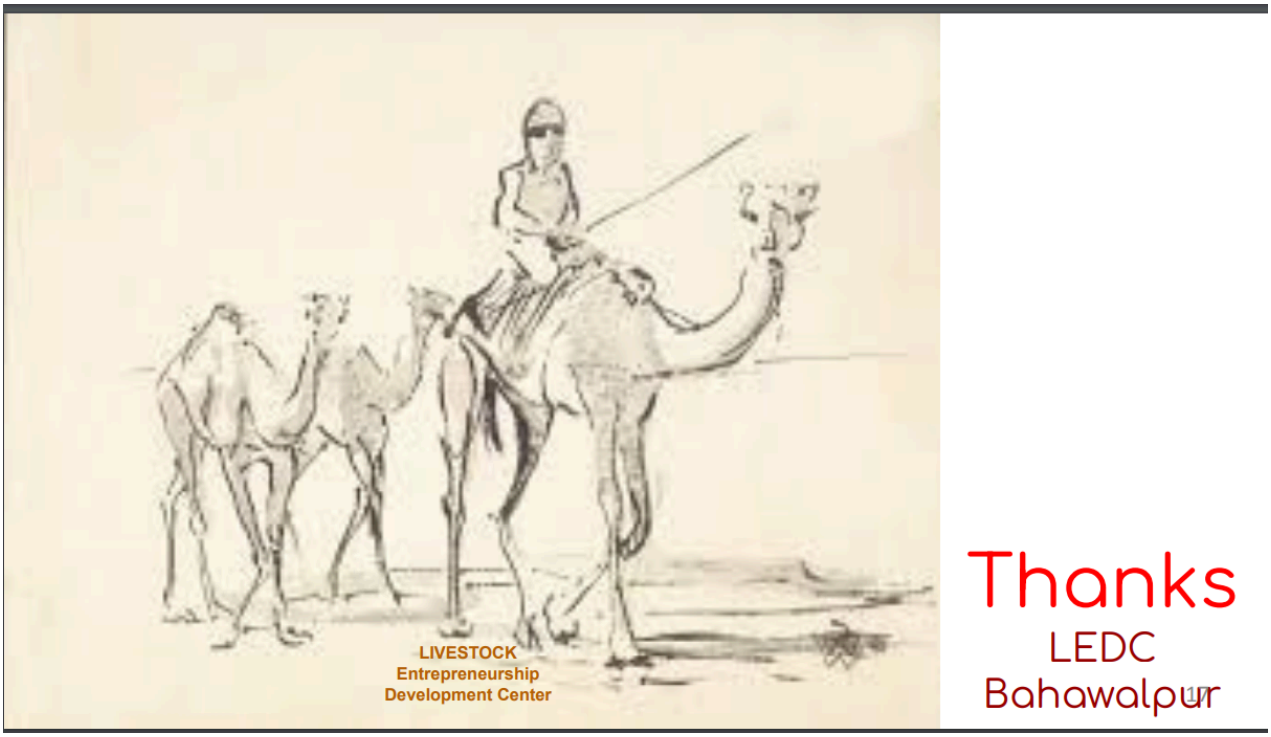
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