



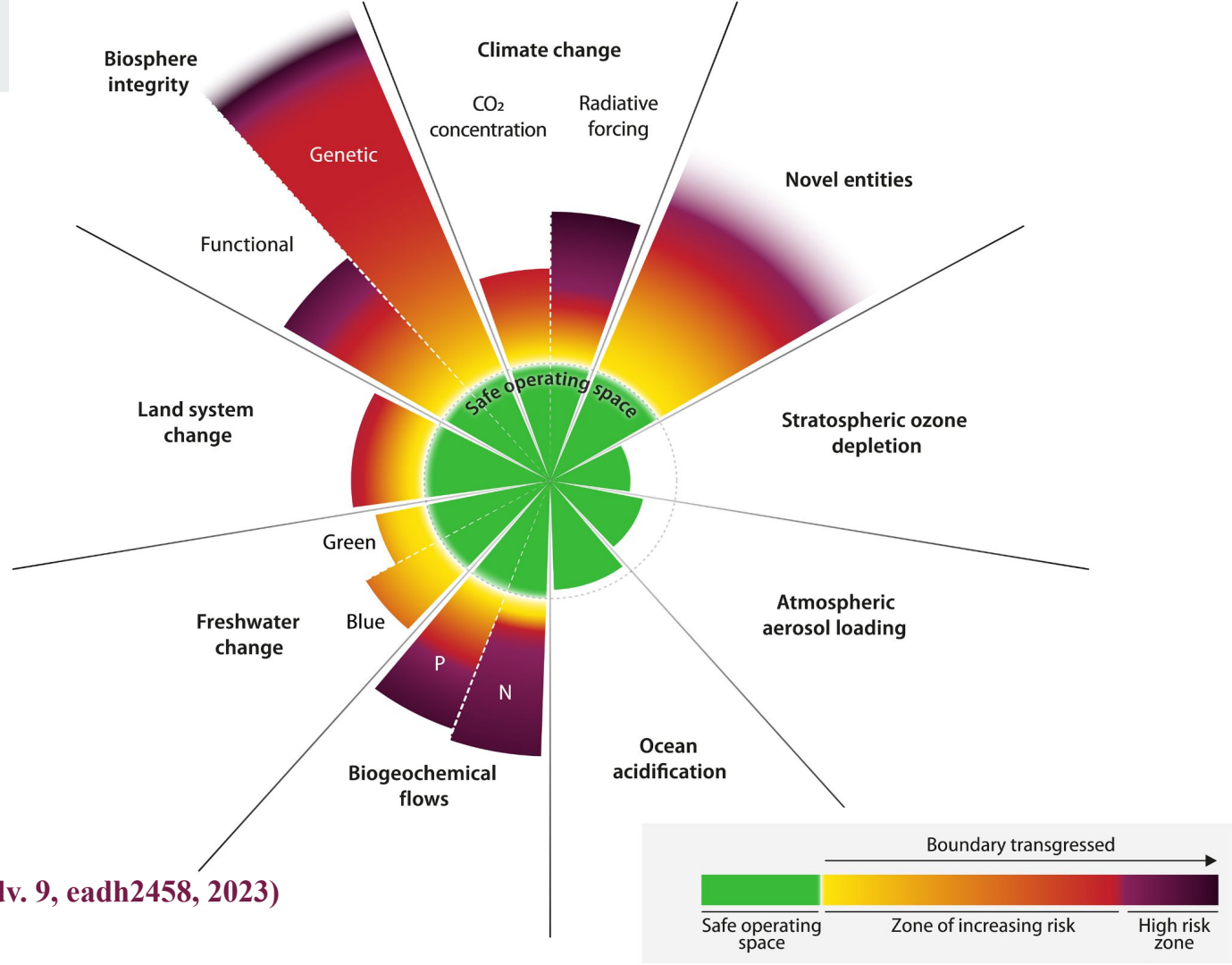
# Integrated approach for maintaining eco-security in Pakistan under NESS-PAK

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<https://dairysciencepark.org/ness/>

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**Six** of the nine planetary boundaries are transgressed up to 2023

(Richardson et al., *Sci. Adv.* 9, eadh2458, 2023)



# The Planetary Boundaries Framework for Earth

- **Biosphere integrity:** Extinction **>100** vs <10 E/m species-years)
- **Climate change:** Atmospheric CO2 **417** ppm vs 350; radiative forcing: **2.91** vs 1 /sqm; Gl Wrm Current **1.4°C** vs 1.5-2.0°C (limit for 1800 to 2100)
- **Novel entities:** synthetic chemicals; radioactive materials; GMOs; **~80%** untested synthetics against 1%
- **Freshwater change:** **~18%** (blue water, surface/ground) and **~16%** (green water, root-zone soil moisture) vs 1860
- **Land system change:** **85%/50%/85%** for boreal, temperate, tropical forests vs 100% for 1700 AD

([Richardson et al.](#), Sci. Adv. 9, eadh2458, 2023)

# The Planetary Boundaries Framework for Earth (contd)

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- **Biogeochemical flows:** P: Flow from freshwater to the ocean through fertilizers, **22** Tg year<sup>-1</sup> vs 11. N: **112** Tg year<sup>-1</sup> vs 62 Tg for agric systems
- **Stratospheric ozone depletion:** **284** Dobson units vs 276; gaseous halocarbon from human activities are hazardous; refrigerants, pesticides, herbicides, disinfectants, sweeteners, plastic polymers, paints, cleaning solvents, electrical insulators; iodized salts; **highly stable against:** burning, acids, alkalies, decomposition
- **Atmospheric aerosol loading:** **0.1** Aerosol optical depth (AOD) vs = 0.25 (0.25 to 0.5); southern Asia is currently about 0.3 to 0.35; affect monsoon rainfall; ultraviolet aerosol index (UVAI) was higher in southern and central Pakistan and low values in northern (Khan et al. 2023). Particulate pollution
- **Ocean acidification:** **~2.8** carbonate ion conc in surface seawater  $\geq 80\%$  of 3.44, CO<sub>2</sub> emission rising



# NESS-Pak Vision

**To support the research and  
establishment of the *National  
Eco-Security System of Pakistan*  
(NESS-Pak) for 240 million people in  
Pakistan**

# Mission

**Coordinated approach to respond to the challenges faced by the people of Pakistan through: i) Environment Security; ii) Biological Diversity; iii) Food Security; iv) Public Health Security and; v) Livelihood Security**

# 1. The Eco-Security Issues - Climate Security

- Pakistan has been ranked by Germanwatch as the 8th most affected country in the world over the period 2000–2019 (GOP 2021).
- Ranked top 10 ranking of Global Climate Risk Index by Germanwatch.
- ND-Gain Index has placed Pakistan as the 39th most vulnerable country and the 27th least ready' country in the world to address the impacts of climate change.
- In Fiscal Year (FY) 2020, 40% of households suffered from moderate to severe food insecurity and therefore cannot absorb further climate shocks to food systems.
- National consensus to accelerating the transition towards a climate-resilient economy as per Paris Agreement of the UN Framework Convention on Climate Change (UNFCCC).
- Market and non-market-based approaches have been identified to help diversify the funding sources like Nature Performance Bonds, Green/Blue Bonds, Carbon Pricing Instruments.
- Pakistan encourages the private sector to play a crucial role in implementing its climate ambition across sectors and the development of NbS that address its mitigation and adaptation potential.

# Floods 2022

- The 2022 floods submerged one third of the country, affecting 33 million people, half of whom were children.
- The floods damaged most of the water systems in affected areas, forcing more than 5.4 million people to rely solely on contaminated water from ponds and wells ([UNICEF 2022](#)).





# UN Climate Conf COP27

- The Conference was held at Sharm El Sheikh, Egypt.
- The catastrophic climate change induced floods in Pakistan during 2022 that resulted in losses and damages of over US\$ 30 billion refocused the global attention towards this critical issue.
- Pakistan welcomed the historic decision of COP27 to establish the Fund for Loss and Damage ([MOFA](#), GoP, 20 November 2022; [Arab News](#)).



# Mitigation Strategy

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- Climate Change Adaptation
- Biodiversity
- Disaster Preparedness
- Socioeconomic Measures - Poverty and Gender
- Climate Change Mitigation
  - Energy Generation and Conservation
  - Transport
  - Industry
  - Urban Planning & Waste Management
  - Agriculture and Livestock
  - Carbon Sequestration and Forestry

[\(National Climate Change Policy 2021\)](#)

## 2. The Eco-Security Issues - Biological Diversity

- Pakistan signed the Convention on Biological Diversity (CBD) at the 1992 Rio Earth Summit.
- National Biodiversity Strategy and Action Plan (NBSAP) - 2017-2030 sets the strategic priorities and roadmap for Pakistan.
- 198 mammal species (6 endemic), 700 bird species (25 endangered) ( ([MCC 2019](#)))
- 177 reptile species (13 endemic), 22 amphibians (9 endemic)
- 198 fresh-water fishes (29 endemic)
- 5,000 species of invertebrates
- 6,000 species of flowering plants (over 400 endemic)
- 3,000 taxa and around 500 wild relatives of crops
- Two breeds of buffalo, eight of cattle, one yak, 25 goat, 28 sheep
- One horse, four camels and three poultry breeds
- However, this biological diversity is now declining due to large scale anthropogenic activities and the degradation of natural habitats.

# Strategies and Action Plan

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- Biodiversity awareness
- Gender, Poverty and Biodiversity Nexus
- Mainstreaming biodiversity in national planning and policy process
- Terrestrial Ecosystems, Habitats and Species
- Forest Ecosystems
- Inland Wetland Ecosystems
- Coastal and Marine Ecosystems
- Sustainable Agriculture and Agrobiodiversity
- Sustainable Production and Consumption
- Synthetic biology, challenges and opportunities

## 3. The Eco-Securities Issues - Food Security

### The Food Resourcebase

- Total Cropped Area: 24.1 million hectares ([FAO 2023](#))
- GDP Share: Services Sector: 58.6%; Livestock 14%, Crops 8.9%. Industry 18.5%
- 4th largest Basmati rice exporter in the world
- Textile exports account for 60 percent of total
- Indigenous oil production caters to 30 percent of the domestic energy demand
- Food imports have increased to USD 9 billion, half of which is edible oil
- Employs 37.4 percent of the national labour force
- Contributes 70 percent of exports
- 30.5 million hectares (47% of the national land is agricultural land, higher than the global average of 38 percent.



# The Food Resource-base - Livestock

- Livestock population: 225 million ([FAO 2023](#))
- Value addition of PKR 5.5 trillion in 2023
- The 5th largest milk producer with a gross annual production of 67 million tonnes
- Fetches USD 950 million in leather exports; the 4th in at World level

## The Issues ([DSP Society Profile 2019](#))

- Poor practices at farmers' and industry level limits productivity and products quality
- Limited scope of education system create hurdles in food safety and entrepreneurship
- Slaughter houses/poultry butchers delivering low quality meat
- Farming and farm products creat threats to public health
- Underutilized/unskilled labor at farms, factories and marketing networks
- Price capping of livestock products restricting industrialization
- Public Service Organizations (PSOs) ignore the entrepreneurship aspects of the sector
- Input suppliers grabbing major share of farmers' produce for low quality inputs
- Livestock transportation/marketing in open places and vehicles contaminate the environment

# The Issues

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

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



# The Dairy Science Park Approach

## The Mission


Utilization of indigenous human and natural resources for welfare of the people around the Globe, through academia – industry linkages, with focus on entrepreneurship development, Halal/hygienic food production, biorisk management and production of quality-certified products

## The Approach ([UN SDG Action 40154](#))

- Focusing on SME production and processing units
- Sensitizing public and NGO sectors to reshape their functions for better services.
- Shifting pricing policy to quality based pricing or free market based on quality standards
- International Conferences and Industrial Exhibitions
- Biorisk Management Initiative
- Livestock Technoparks suggested ([FAO-UN 2019](#); [ITC-UN 2022](#))


سوداں حکومت سب سے بہتر صحت مند گوشت کی پیداوار بڑھانے، مقامی مارکیٹ فراہم کرنے اور حلال گوشت برآمد کرنے کیلئے مخلصانہ اقدامات کر رہی ہے۔

پشاور میں ڈیری سائنس پارک بورڈ کا قیام عمل میں لایا جائے گا جس میں مختلف سرکاری  
 محکموں کے ساتھ ساتھ نجی شعبے سے بھی ماہرین کو شامل کیا جائے گا اور اس سلسلے میں ایک  
 سمی وڈ پرائیویٹ خیریت خونی کو منظور کیلئے تجویز کی جائے گی۔ ڈیری سائنس پارک کے  
 قیام کے نتیجے میں نہ صرف صحت مند گوشت کی پیداوار بڑھے گی بلکہ ہزاروں بے روزگار  
 لوگوں کو مقامی سطح پر روزگار کے مواقع فراہم ہو سکیں گے جبکہ پشاور میں تقریباً دو سو ملین  
 روپے کی لاگت سے اعلیٰ معیار کا ایک مذبح خانہ بھی تعمیر کیا جائے گا اور مذبح خانہ کی تعمیر  
 میں پشاور ڈیولپمنٹ اتھارٹی اور ڈیری سائنس پارک کی ٹیم ایک دوسرے کی بھرپور  
 معاونت کریں گی تاکہ لوگوں کو معیاری حلال گوشت کی فراہمی کو یقینی بنایا جاسکے۔



تمکینت اللہ خاں  
 منیجر پبلک ریلیشنز، ایف۔ ایف۔ ایف۔

Directorate of  
**INFORMATION & PUBLIC RELATIONS**  
 Government of Khyber Pakhtunkhwa





# National Food Security Policy - Strategic Framework

## Strategic Framework (GoP 2018)

- Developing close partnership with the Provincial Governments, entrepreneurs, research scientists, investors, exporters, importers, academia, progressive farmers and civil society for achieving Food Security and Nutrition (FSN)
- Periodical deliberations of National Food Security Council (NFSC) on the issues of agricultural development and food security.
- Provide the requisite patronage to agriculture sector at the highest level to achieve the synonymous goals of food and the national security of the country.
- Shifting the current emphasis of the PSOs from a few crops such as wheat, rice, sugarcane and cotton towards other aspects such as:
  - raising incomes and employment through developing business clusters
  - the efficient use of water, land, rangelands, pasture and forests
  - safe food production for better environment and climate change compatibility
  - equity including how to empower women and vulnerable groups such as shared croppers, tenants, the landless, transhumants and marginalized communities

## The Dairy Science Park Approach

- Proposed Livestock Technopark Peshawar and Quetta under [FAO-UN](#) and [ITC-UN](#) Consultancies

## 4. Public Health Security

### Challenges

- Shortage of Human Resource in health; Pakistan has one of the lowest doctors, dentists, nurses and paramedics to population ratios ([National Health Vision Pakistan, 2016-2025](#))
- Maldistribution of HR, retention issues and low work-place satisfaction levels
- Brain drain at all levels
- Professional education in health is run at suboptimal level without synchronizing the curriculum with modern pedagogic techniques, int'l standards and the local requirements
- Licensing and renewal of licensing of health practitioners is weak, and is not linked with improved qualification, competence, performance and continuous professional development
- Weak institutional levers for gauging the performance of health staff
- Apparent stagnancy in the coverage of community health workers, and their numbers, coverage and quality are far from the required standards

# Thematic Pillars

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- Health Financing: responsive and efficient health financing
- Packaging Health Services: To improve the coverage and functionality of health services
- Human Resource for Health: To tailor education to the health needs of the population
- Health Information Systems and Research: Technologies utilization for speedy/reliant information
- Governance: PSOs to rebuild their stewardship of the health system through professional independent advice and strive to become the forefront provider of essential health services
- Essential Medicines and Technologies: Health Technology Assessment (HTA) capacity will be created at various levels of Governments and will be vigilantly monitoring the system
- Cross-Sectoral Linkages: Focus on cross-sectoral action for advancing health, with a particular focus on communicable and non-communicable disease
- Global Health Responsibilities: Global sustainable agenda will be reflected in all health strategies and plans, for which governments will be provided technical support and appropriate expertise

## 5. Livelihood Security



[Small and Medium Enterprises \(SME\) Policy 2021](#) was launched by the Ministry of Industries and Production, Govt of Pakistan. The following situation was highlighted:

- SMEs base comprises manufacturing, services and trading.
- SMEs are distributed among micro and small enterprises with limited investment; access to resources and services; unskilled labour and ineffective linkage with the universities.
- SMEs face higher and disproportionate costs of regulatory and tax compliance, compelling SMEs to remain unregistered and informal. Interface with PSOs is considered predatory.
- Export-oriented SMEs are concentrated in textile, light engineering, surgical and sports goods; mostly in low value added products. Inter-firm collaboration is not supported by the Policy, preventing scale-ups.
- Infrastructural provision like industrial estates, roads, electricity, security, etc, are deficient and SMEs are located in congested urban areas, restricting their growth.

# Policy Framework

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- Macro Policy and Regulatory Environment: Government interventions to ensure a more stable macro environment conducive for SMEs growth.
- Supply Chain Challenges: Provision of quality and affordable business development services, suitable credits, productive manpower, innovations space and opportunities and sustainable infrastructure.
- Demand side Challenges: Local and international market access and increasing demand opportunities.
- Institutional mechanisms: For strengthening the voice and representation of SMEs, comprehensive implementation; and for tailoring government decisions with the SMEs requirements.

# Preparatory Committee NESS-Pakistan



**President:** Prof Muhammad Subhan Qureshi (FDS)

**Secretary:** Prof Sher Bahadar Khan (PHS)

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# Preparatory Committee NESS-Pakistan, continued

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## Member Academia continued...

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22. Mr Imran Khan (LLS)

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31. Advocate Murtaza Qureshi (ENS)
32. Mr Abdul Qadoos (ENS)
33. Dr Jassar Aftab (ENS)
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## Eco-Security Components:

- i) Environment Security (ENS, 7); ii) Biological Diversity (BLD, 9); iii) Food Security (FDS, 8);
- iv) Public Health Security (PHS, 5) and; v) Livelihood Security (LLS, 7)



# Terms of Reference for Preparatory Committee of NESS-Pak



- Will get the support of representatives of the: i) Universities; ii) Research and development institutions and government departments and; iii) industry and civil society, in Pakistan; and comply with the requirements of the national laws, regulations and policies on Biodiversity, Food Security, Climate Change and SMEs development.
- Support and participation in the “One Target · An Eco-Security System for All People Initiative” (Pakistan Edition) to support the research and establishment of the National Eco-Security System of Pakistan for 240 million people in Pakistan. Names, title/position, affiliated institution of all supporters will be put on the global supporter list ([https://www.ness.link/h-nd-17.html#\\_jcp=1](https://www.ness.link/h-nd-17.html#_jcp=1)) to recognize their contributions.
- Discussion will be held on the issues relevant to NESS scientific research in Pakistan, and NESS-Pak Scientific Committee will be established and related operation methods (such as the draft management statutes), and draft the work framework and workplan will be prepared.
- This positive scientific action would not cause an international or domestic negative impact. Progress will be shared with NESS-ISN Beijing from time to time.

# Action Plan for NESS-Pakistan



- Declaring AWKUM Mardan as the host institution for establishing Pakistan Eco-Security Center (PESC) jointly with with Preparatory Committee for National Eco-Security System Pakistan (NESS-Pak) and NESS-International Science Network (ISN), Beijing
- Awareness Campaigns about gravity of the situation of planetary boundaries
- Conducting Interdisciplinary Workshops for identifying and prioritizing Eco-Security issues
- Motivating the members and other influential stakeholders on the issues
- Developing Interdisciplinary Research Plan on Eco-Security Issues
- Developing postgraduate courses and training programs on eco-security
- Developing National Eco-Security Strategy and Plan

# References and Courtesy



## References

- [Dairy Science Park](#)
- [List of Supporters of NESS: Download](#)
- [National Climate Change Policy 2021](#)
- [National Biodiversity Strategy and Action Plan 2017-2030](#)
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- [Richardson et al., Sci. Adv. 9, eadh2458, 2023](#)
- [Khan et al, 2023](#)

## Courtesy

- Courtesy Smiling Earth: [everypixel.com](https://everypixel.com)

# A Chance for Survival for our Grandkids



1959 (3.0 b)

Environment +  
Biol Diversity + Food +  
Public Health + Livelihood =  
**Eco-Security**



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