

Understanding of BWC by Academia in developing countries

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Doctor infected with Congo virus dies in Karachi

- Congo, a viral disease that spread through tick bite, is increasing in the world and the deaths are occurring on daily basis. The common symptoms of it are observed as fever, headache, joint, nausea, stomach pain, loose motions. The disease is reportedly very common in Africa, Asia, East Europe and Middle East. The CCHF virus cause severe viral hemorrhagic fever outbreaks, with a case fatality of 10% to 40%.
- The virus continues to open a serious health feature. It is also spreading alarmingly in Pakistan where about 59 Congo virus cases have been reported since 2010. 10 cases in Balochistan and 2 in Karachi were found in 2014. Owing to absence of vaccine and facilities, it is uncontrolled. **Rising awareness is the only way to control the disease.**



Key Provisions of the BTWC

- Art 1 Never develop, produce, stockpile etc
- Art 2 Destroy or divert to peaceful purposes
- Art 3 Not to transfer, or assist, to acquire
- Art 4 National implementation measures
- Art 5 Consultation to solve implementation problems
- Art 6 Investigation of alleged breaches
- Art 7 Assist States exposed to danger
- Art 10 Encourages peaceful uses of bio-science and tech through mutual cooperation

Dimensions of BTWC

- **The BTWC can be considered to consist of several 'regimes'**
 - **Regime of Compliance**
 - **Regime of Development**
 - **Regime of Permanence/Institutionalisation**
 - **Regime of Research**

Duty as a scientist:

- The current debate about biological weapons is certainly important in raising awareness and increasing our preparedness to counter a potential attack
- Biological weapons are unique in their invisibility and their prolonged effects.
- Bio-warfare attacks are now a possibility and the development of biological and chemical weapons is a real threat, and efforts to control its proliferation are limited.
- Science is neutral/apolitical/value free
- Science is impartial pursuit of knowledge and knowledge is inherently good, or
- Knowledge is neither good nor bad, applications (by others) is what can be good or bad

Proliferation Risks of Dual-Use Research

Categories of risk

- Technologies that deliver beneficial drugs to the body could be used for **weaponizing biological agents**
- Research could have **unintended consequences**
- Dangerous agents could be **released accidentally** from the lab through **infected personnel**
- Research **results can be published** in easily accessible journals and on the Internet
- Knowledge or techniques could help to create **“novel” pathogens** with unique properties or create entirely **new classes of threat agents**
- Dangerous agents could be **stolen or diverted** for non-peaceful purposes

Education and Information

- **Scientists should be aware of, disseminate & teach the national & international law & regulations, as well as policies & principles aimed at preventing the misuse of biological research.**

Accountability

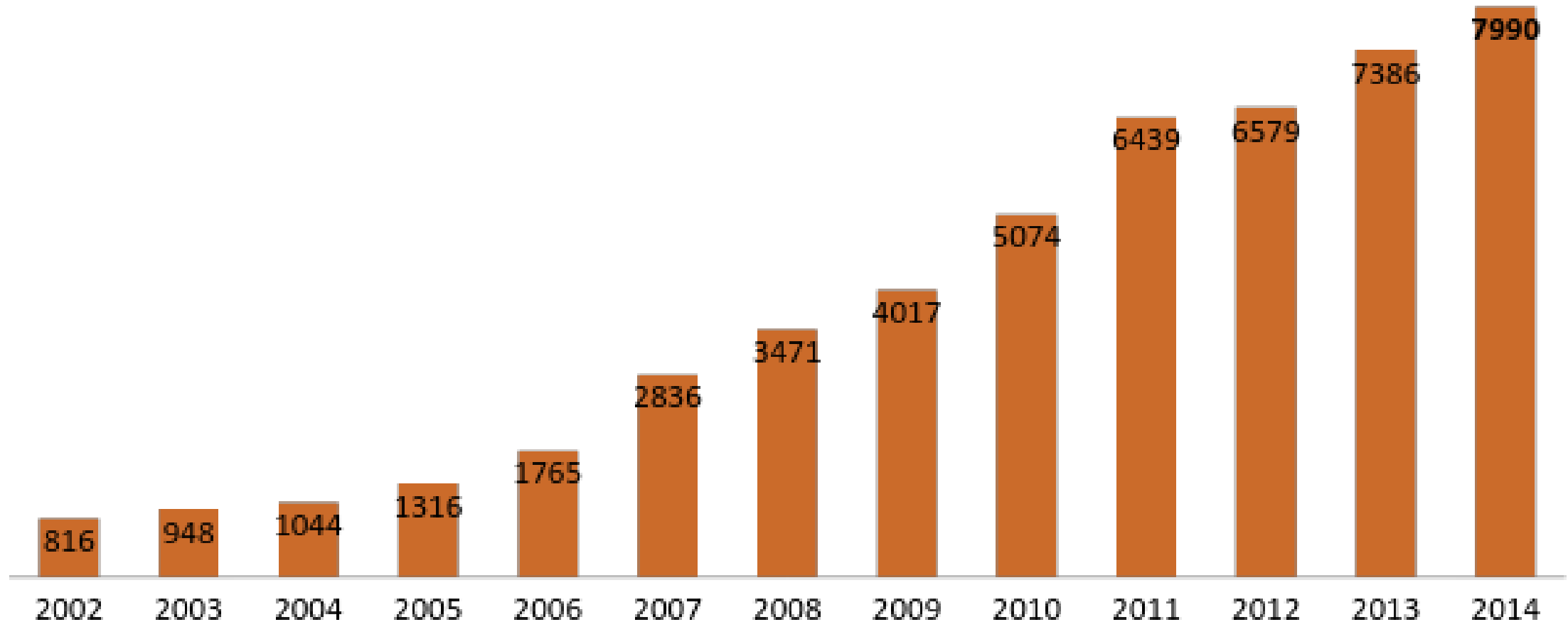
- **Scientists who become aware of activities that violate the Biological & Toxin Weapons Convention or international customary law should raise their concerns with appropriate people, authorities & agencies.**

Oversight

- **Scientists with responsibility for oversight of research or for evaluation of projects or publications should promote adherence to these principles by those under their control, supervision or evaluation and act as role models in this regard.**

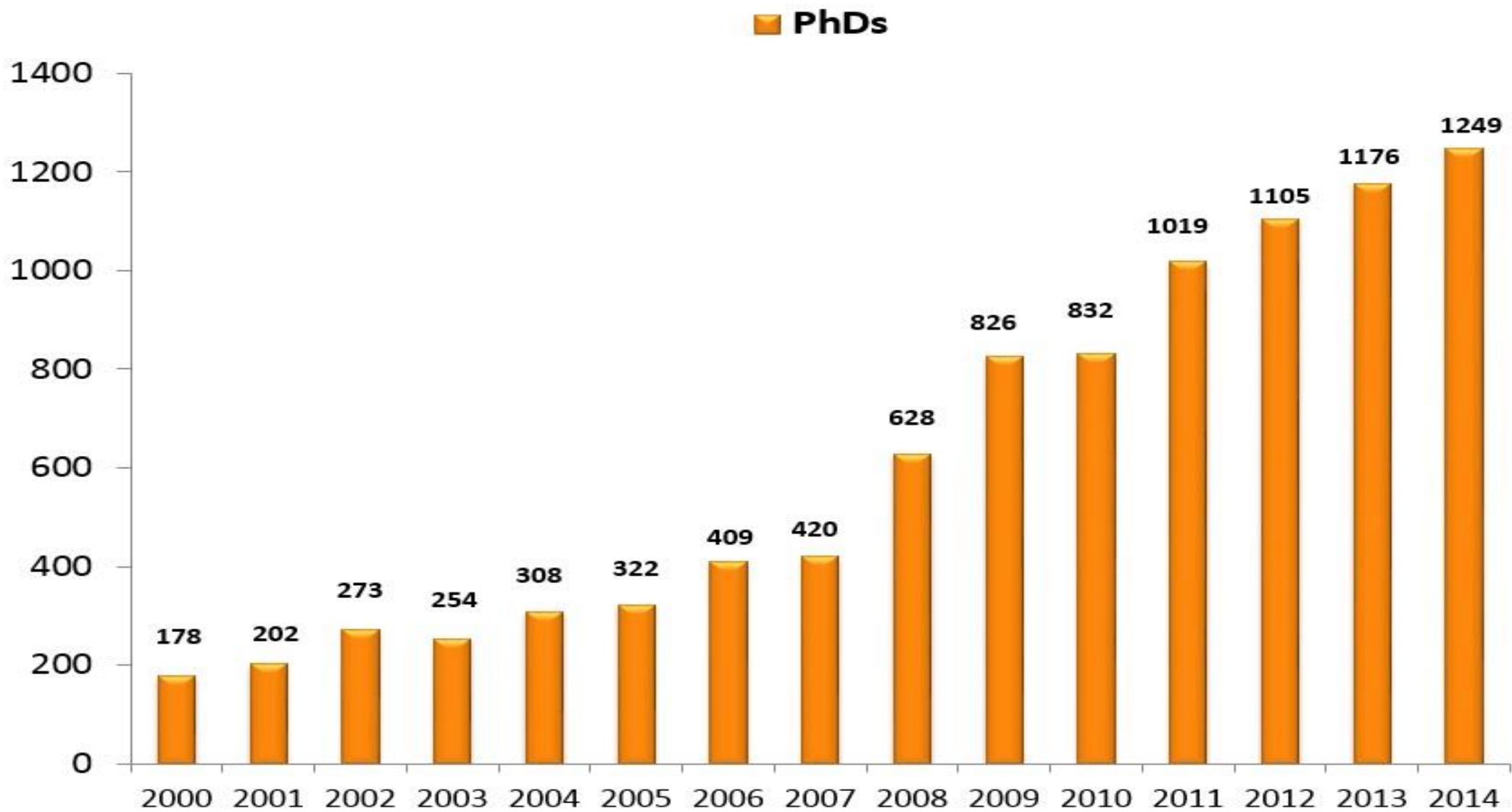


The impact of research initiative of HEC on the academic research



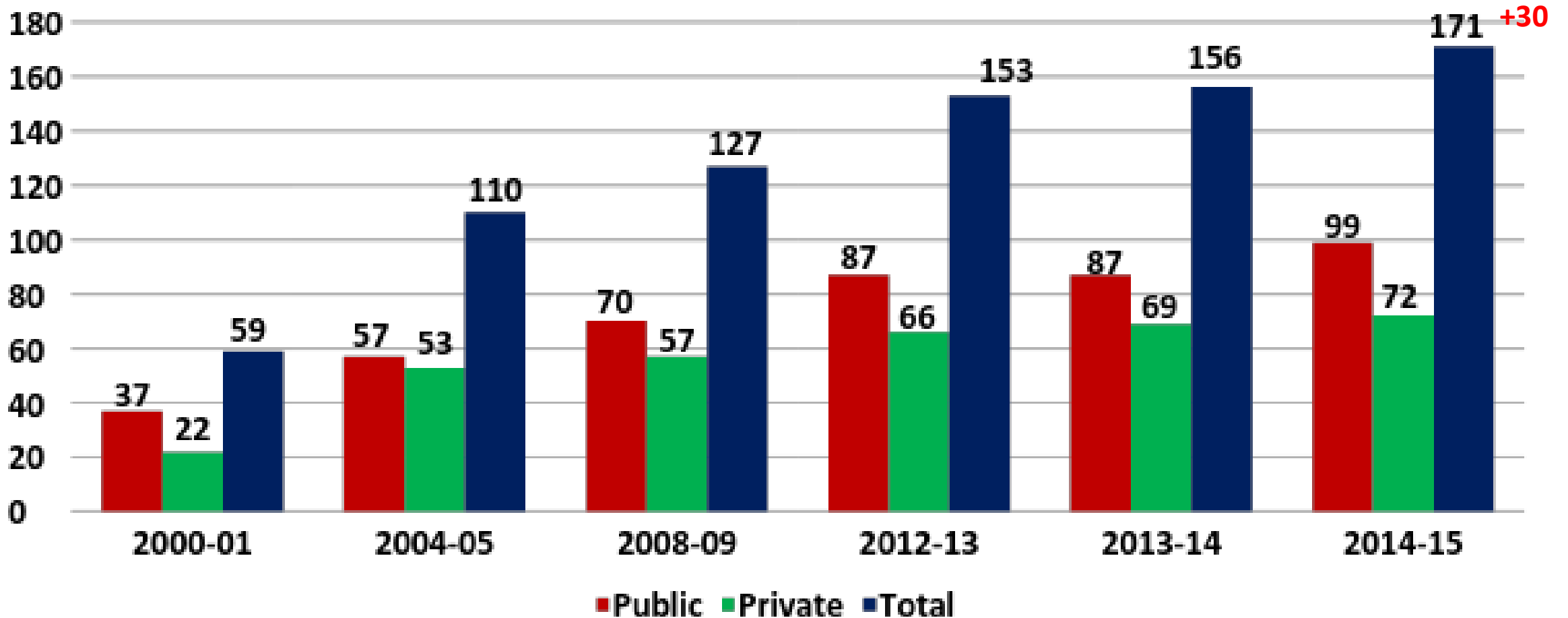


Year Wise PhD output of Pakistani HEIs



Provisional figures of year 2012, 2013, 2014

Growth of Higher Education Institutions (HEIs) in Pakistan (2000 – 2015)



Global Partnerships

Committee on International Security and Arms Control: Policy and Global Affairs

International Council
for Life Sciences

American
Association for
Advancement
of Science

IAP

Pakistan

Biosecurity
Engagement
Programme

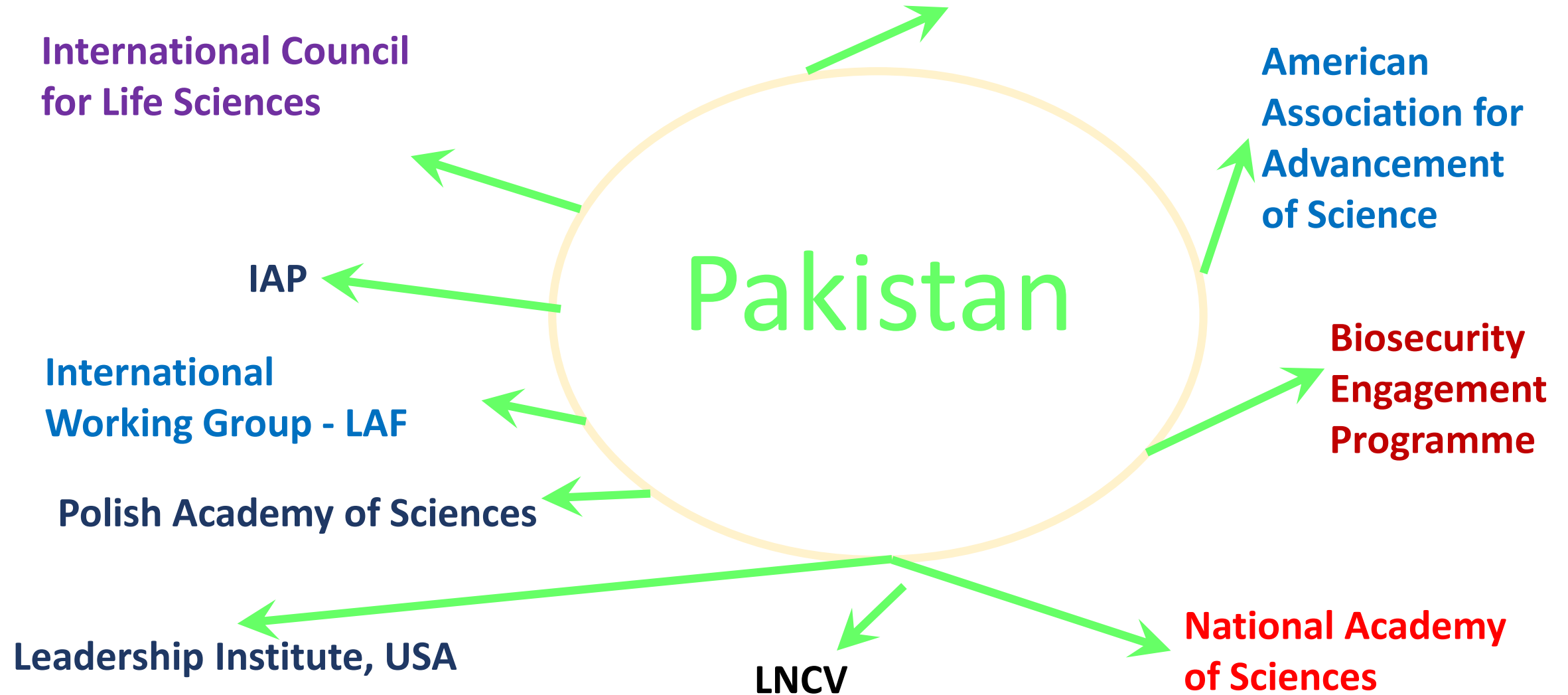
International
Working Group - LAF

Polish Academy of Sciences

National Academy
of Sciences

Leadership Institute, USA

LNCV



- **Our comprehensive National Report to the UN Security Council's Committee on UNSCR-1540, provides a detailed matrix of information on the existing legislation and its enforcement to deal with any threat against use of Biological or Toxin Weapons**
- **Pakistan has made appreciable progress in implementing legislation, formulation of new laws and taking effective administrative steps for mitigation of biological risks.**

NDMC

Biological hazard response

NDMA

Responsible for laying down the policies, laws and Guidelines for disaster management

PDMC

PDMA

PDMA, Khyber Pukhtonkhwa

PDMA, Sindh

PDMA, Punjab

PDMA, Baluchistan

PDMA, Gilgit Baltistan

24 Districts

Khyber Pukhtonkhwa Disaster Management Authority

DDMA

9 Districts

Gilgit Baltistan Disaster Management Authority

36 Districts

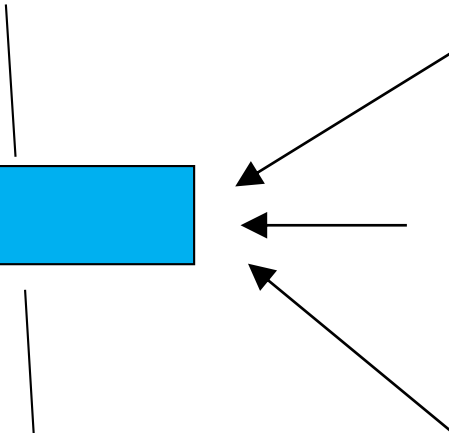
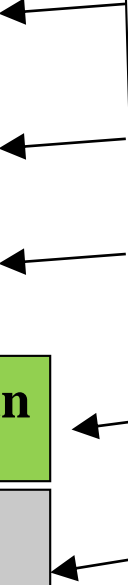
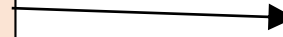
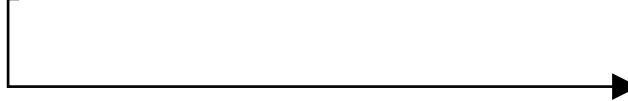
Punjab Disaster Management Authority

23 Districts

Sindh Disaster Management Authority

32 Districts

Baluchistan Disaster Management Authority



Proactive Measures

Stockpiling Medical Therapeutants
CBM
Seminars & awareness, Training
Biodefence & Biosecurity
Education material
Diagnostics

Preventive

Surveillance
Export control
Finance
Scientific cooperation
Law and Regulation

Preparatory

Export control
Planning (Pathogen management)
Immunizations and antibiotics
Epidemiological capacity

Containment

Isolation and Decontamination
Crises management
Mutual aid agreement

Aftarcare

Recovery mechanism
Cooperation on multiple nexus

Bioterrorism event

Post event scenario

Paramedics
Clinicians
Veterinarians
Agriculturists
Social workers
Rescue teams

Sampling

Response Plan

Law & Enforcement
National Disaster Management Authority
National crises management cell
Ministry of Agriculture and Livestock
Environmental Protection agency
Ministry of Science and Technology
Ministry of Health

NIH

NARC

VRI

PCSIR

**Pakistan
Environmental
Protection Act,
1997**

**Anti-Terrorism
Act, 1997**

**Pakistan
Export Control
Act-2004**

**Plant
Quarantine
Act, 1976**

**National
Policy
Making**

**Pakistan
Biosafety Rules,
2005**

**Animal
Quarantine
Act, 1979**

Policy Making

**National
Biosafety
Guidelines 2005**

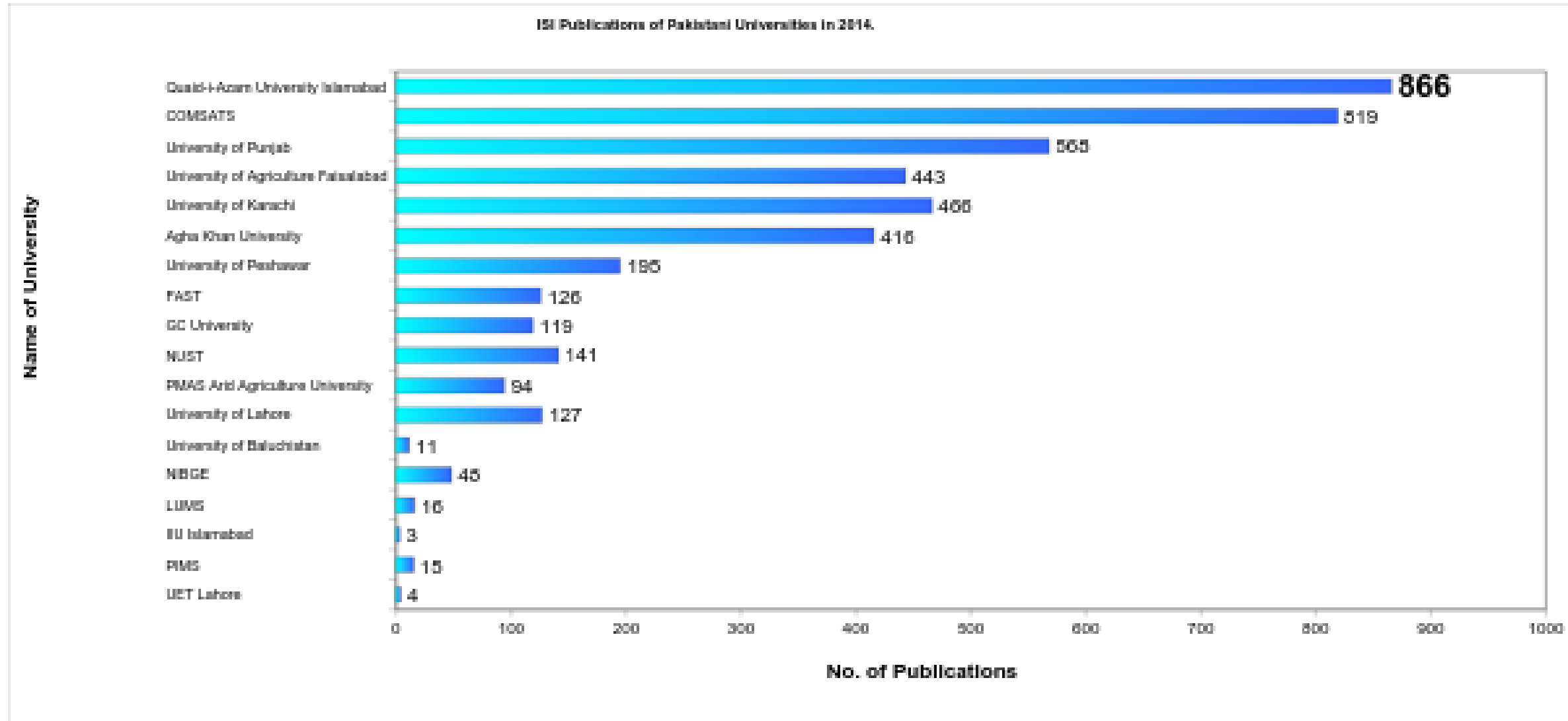
**DRAP,
2012**

**National
internal
security policy
(NISP), 2014**

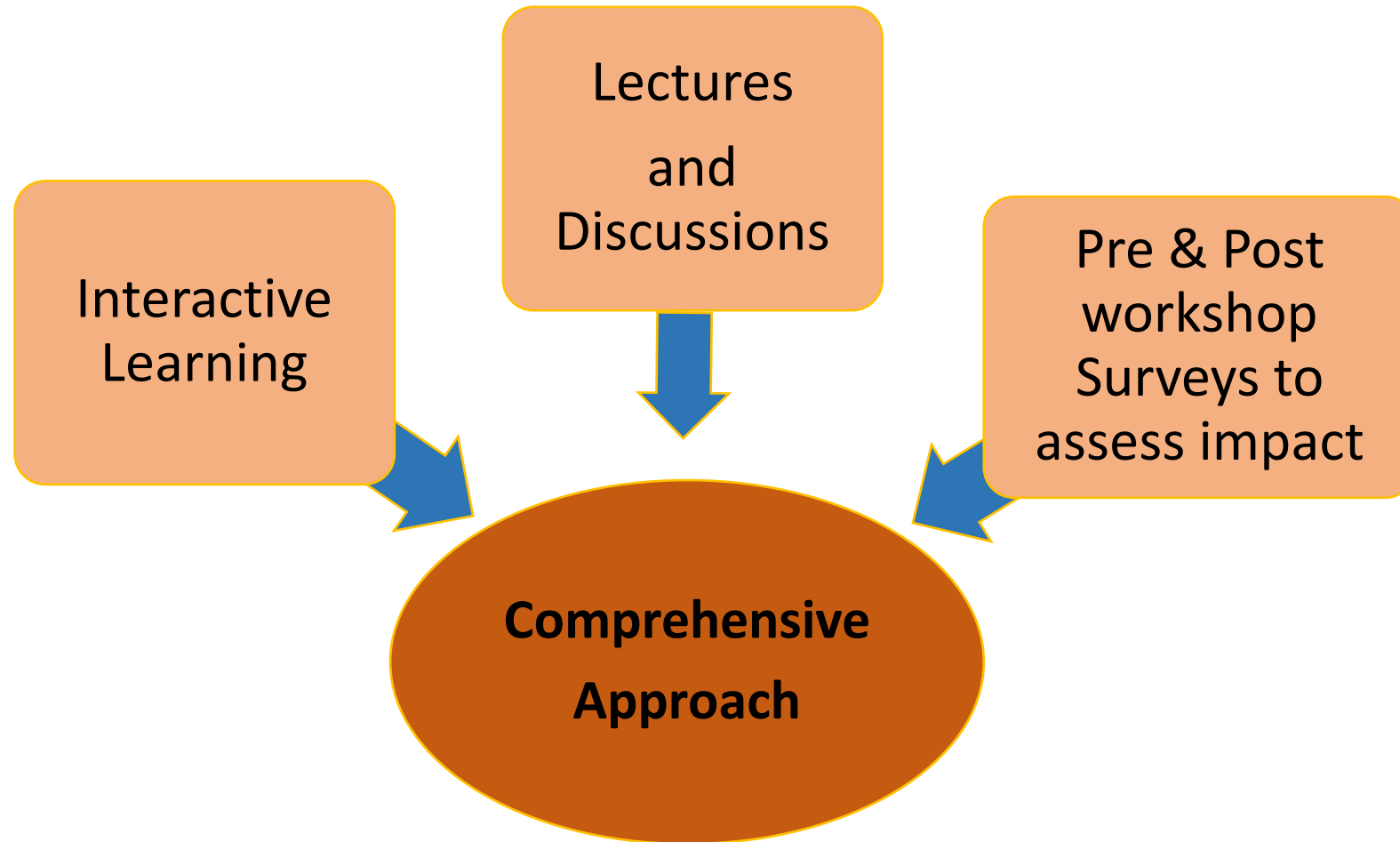
**The National
Counter Terrorism
Authority Act,
2013**

Quaid-i-Azam University

Impact Factor Publications of Selected Pak. Universities in 2014



Workshops Agenda: Broader Perspective



Workshop on “Raising awareness on dual use concerns in Biotechnology” in Islamabad

Participants



A total of 74 students alongwith faculty members from various universities participated in the workshop



Mainly from

- Biotechnology department of Quaid-I-Azam University
- Biotechnology department, Islamic International University, Islamabad
- Environmental Sciences department, Fatima Jinnah Women University, Rawalpindi





iap



Policy Makers & Practitioners Awareness Workshop on Dual-Use Education

March 30, 2015

Organized by

Pakistan Academy of Sciences (PAS)

Department of Biotechnology, Quaid-i-Azam University (QAU)

The Global Network of Science Academies (IAP)



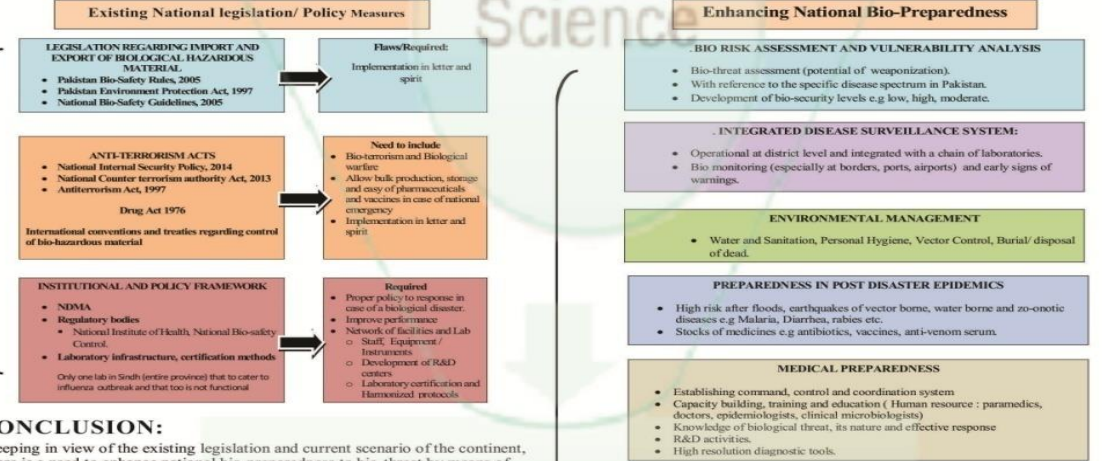


ENHANCING NATIONAL BIO-PREPAREDNESS TO BIO-THREAT

Authors: Rida N, Naseer A, Mariam K, Najeb ullah, Ramsha B, Kancez F, Tanzeel Z, Ghazala, Z.A. Shanwari

INTRODUCTION:

- **BIOLOGICAL DISASTERS:**
 - **INDELIBRATE:** Natural: epidemics or pandemics of existing, emerging or re-emerging diseases
 - **Epidemics:** In 1916 "**POLIO EPIDEMIC**" occurred in the United States.
 - **Accidental:** In 1918 "**THE SPANISH FLU**" mutating influenza viruses swept through the military lines in World War I to the civilian population.
 - **DELIBERATE:** Pestilences or man-made, use of disease causing agents in Biological Warfare (BW) operations or incidents of Bioterrorism (BT).
 - **Bioterrorism:**
 - In 6th Century "**ERGOTISM BY RYE ERGOT (sclerotia)**" by the Assyrians against the Israelites.
 - In 1763 "**SMALL POX**" infected blankets were given by British Army to Delaware Indians.
 - In 1942 "**ANTHRAX SPORES**" filled five thousand bombs were made by US army and used in experiments at Camp Detrick in Maryland.
- **BIOPREPAREDNESS:** is a way to handle biological disaster.
- **Current Pakistan bio-preparedness to bio-threat.**
 - Various bio-safety and bio-security measures have been taken in this regard using both the legislative/policy instruments.
 - The formation of working groups and organizations to ensure public health and safety.
- **Aim of Study:** To study existing legislative and regulatory measures regarding bio preparedness and the way of enhancing national bio-preparedness to bio-threat.



CONCLUSION:

Keeping in view of the existing legislation and current scenario of the continent, there is a need to enhance national bio-preparedness to bio-threat by means of above mentioned issues including

- Implementation of existing laws.
- Development of diagnostic bioterrorism response strategies
- Multisectoral and international laboratory cooperation to obtain rapid detection and identification of bio-threat agents.
- Laboratory infra structure and standards.
- R&D activities, validation and implementations of methods.
- Efficient IT-systems for sharing of data

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2. Rickard Knutsson (2012). Diagnostic Bioterrorism Response Strategies, Bioterrorism, Dr. Stephen Morse (Ed.), ISBN: 978-953-51-0205-2, InTech. Available from: <http://www.intechopen.com/books/bioterrorism/diagnosticresponse-strategies>



Biosecurity
Competence

Natural or Deliberate Outbreak in Pakistan: How to Prevent or Detect and Trace its Origin: Biosecurity, Surveillance, Forensics

Zabta Khan Shinwari · Ali Talha Khalil · Anwar Nasim

Received: 18 February 2014 / Accepted: 23 May 2014
© L. Hirszfeld Institute of Immunology and Experimental Therapy, Wrocław, Poland 2014

Abstract Over the last few decades biosecurity and biosafety have emerged as a prominent public health concern due to some high-profile accidents. Effective strategies to deal with the outbreak, whether deliberate or non-deliberate requires a multidisciplinary approach and coordinated decision-making by various state departments such as health, forensics, agriculture, environment, intelligence, law and enforcement, etc. In a dynamic global environment and the overwhelming asymmetric threats from the non-state actors, it is of utmost importance to understand the biosecurity issues and initiate a coordinated global effort to cope with biosecurity and biosafety breaches and develop an as effective response mechanism. An attractive choice for the terrorists, state enemies and non-

biosafety and biosecurity incident and emphasizes the role of modern technology that can be used in this regard.

Keywords Biosecurity · Biosafety · Outbreak · Biological weapon

Introduction to Biosecurity

Security and safety are among the fundamental principles that lay the foundation of a prosperous society (Van Tuyll 2013). Pakistan is ranked sixth in terms of population (184.35 million) while in stable circumstances, it is expected to be fifth on the list by 2050 (Pakistan Economic



Threats of Agricultural Bioterrorism to an Agro Dependent Economy; What Should be Done?

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Rec date: March 7, 2014; Acc date: May 30, 2014; Pub date: June 2, 2014

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Abstract

The economy of Pakistan is primarily dependent on its agricultural resources. Due to the lack of research regarding threat analysis of germ warfare in Pakistan, it is imperative for the agriculturists to understand the potential hazards associated with an attack on the cash crops that contributes heavily to the overall Gross Domestic Product (GDP) growth. Alarming terrorist activities such as 9/11 and many innovative terrorist strategies like Improved Explosive Devices (IED) in different countries, especially in Pakistan, has increased the potential of bioterrorism. Hence there is urgent need of security risk analysis and preparedness. State of the art research labs are not important for the effective production of biological weapons but certainly innovative strategies are required to effectively implement and counter a bioterrorist plan. Bioweapon infection to some staple crops such as wheat and maize can induce a significant loss that can take years to diffuse. This paper is concerned with the vulnerability of certain important crops in Pakistan that can be exposed as soft targets to certain bioterrorists and discusses the preemptive measures that should be undertaken immediately to prevent any sort of nefarious act of bioterrorism.

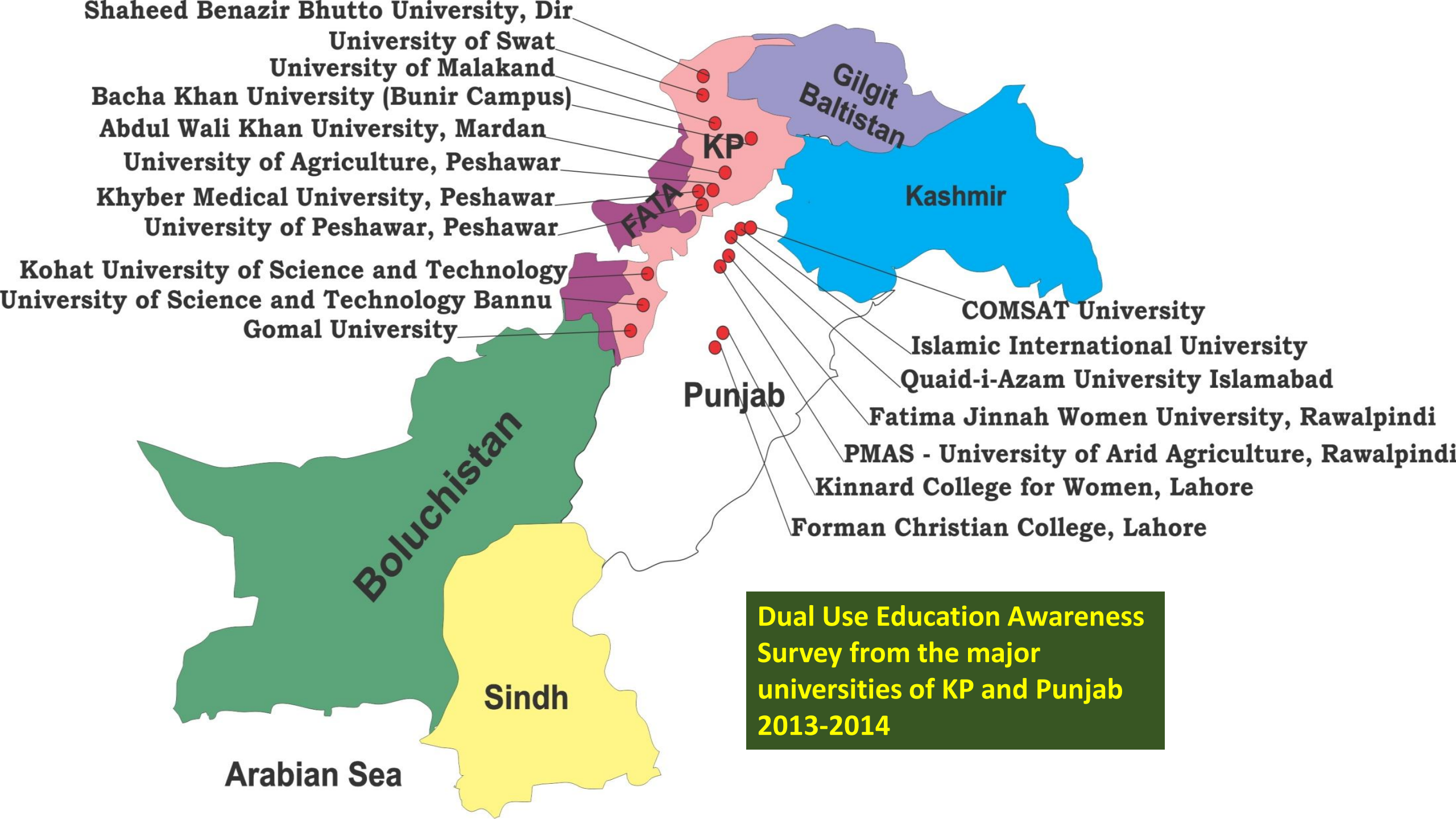
Keywords: Bioterrorism; Pakistan; Biological weapons; Preemptive measures

Introduction

A nation's economic progression and retrogression is the interplay between three important pillars which are agriculture, commerce and

The Vulnerable Agricultural Sector of Pakistan

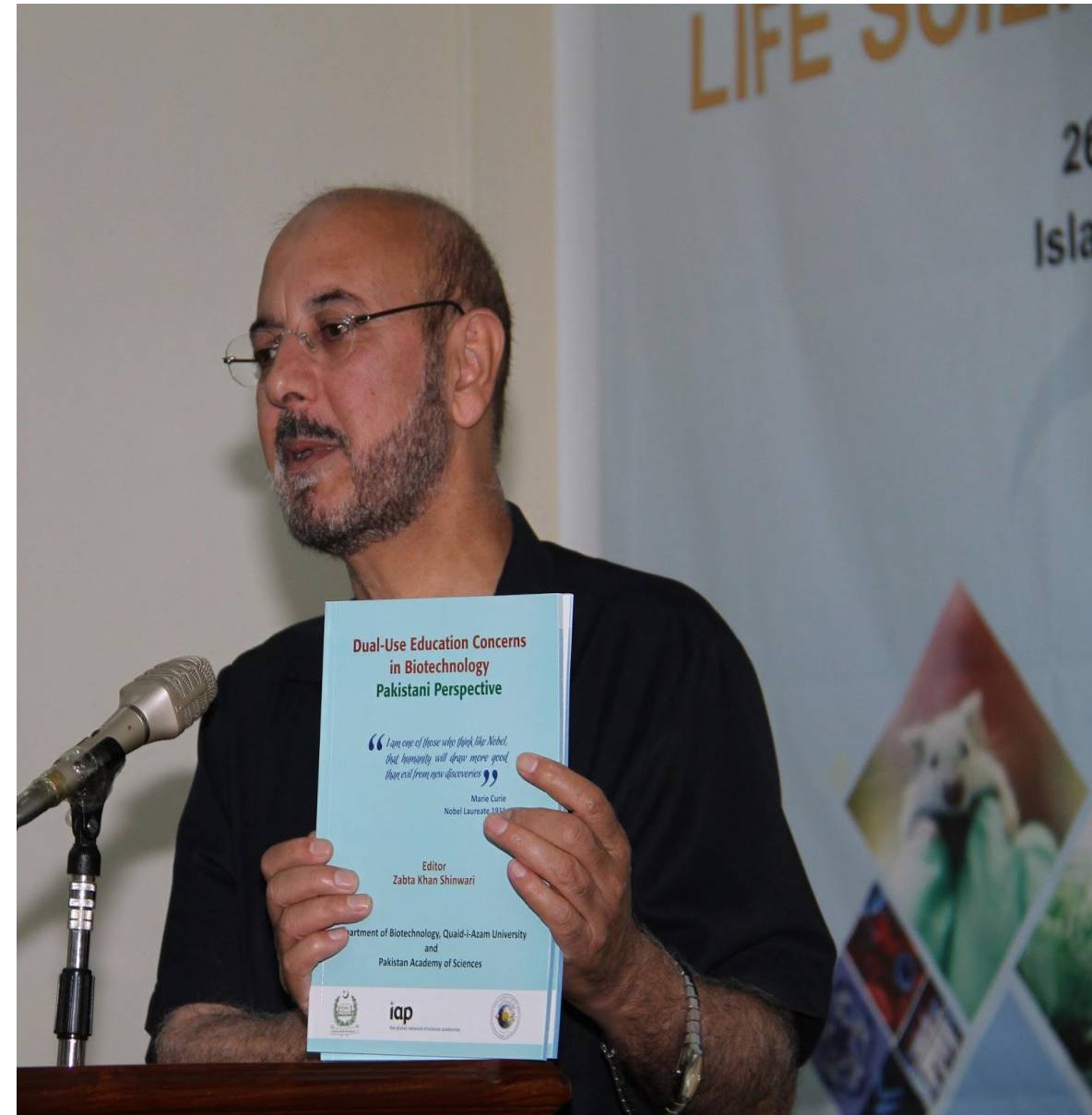
Pakistan, known for its agricultural productivity in terms of wheat, maize and sugar cane, has nonetheless taken for granted the blessing of its abundant food supply. A country must not be complacent regarding food security and food safety. However, in the majority of 3rd world countries, and in Pakistan, such issues are given low



Book Published 2015

In side the Book?

- **An important part of our mission to raise awareness about emerging DURC in Biotechnology**
- **Raising awareness on Dual use education and related policies in Pakistan, their evaluation and recommendations for future**
- **Describing the core concepts of Dual use education**
- **Reviewing our efforts to promote dual use education**
- **Summarizing the Survey results**



Consultative workshop on 'Making Pakistan Science Conscious' held

ISLAMABAD: A consultative workshop on a theme "Making Pakistan Science Conscious" was held at Islamabad Pakistan Academy of Sciences with an aim to promote science and technology in the country mainly on volunteer basis with the support of stakeholders and science lovers.

Participants were representative of all stakeholders, including scientists, academia, government organizations, general public and media. President of the academy Dr Anwar Nasim in his welcome address informed the audience about the history and functions of the academy. He said that the idea of establishing Pakistan Academy of Sciences was mooted in November 1947 at the 1st National Educational Conference held at Karachi.

While, it was inaugurated by

the Prime Minister of Pakistan, Khwaja Nazimuddin, on 16th February 1953, during 5th Pakistan Science Conference at Lahore.

Dr Anwar Nasim said that Pakistan Academy of Sciences could provide a forum for the advancement of scientific research, popularization of science, motivation of scientists and technologists, as well as encourages and promotes studies in new areas of S&T.

Pakistan Academy of Sciences' newly elected Secretary General, Dr Zabta K Shinwari stressed that any progressive country, which aspires to occupy a betting place in the comity of nations, encourages the establishment of a supreme scientific organization, usually designated as the "Academy of Sciences" devoted to the promotion of science and its applications for the general wel-

fare of humanity. He said a comprehensive plan has been prepared to engage all stakeholders especially youth for the promotion of science and technology.

All stakeholders on same page to make Pakistan science conscious

STAFF REPORT ISLAMABAD: Scientists, experts and stakeholders at a consultative workshop have agreed to take forward the mission of popularization as well as creation of awareness of science and technology across the country with full potential by enhancing collaboration with those organizations working in this field on volunteer basis.

The consultative workshop on a theme "Making Pakistan Science Conscious" was recently held on the premises of Pakistan Academy of Sciences with an aim to promote science and technology in the country mainly on volunteer basis with the support of stakeholders and science lovers. The event was chaired by President of Pakistan Academy of Sciences Dr Anwar Nasim.

Besides others, the event was attended by HEC Chairman Dr. Mukhtar Ahmed, President ECO Science Foundation Dr. Manzoor H Soomro, Rector of International Islamic University Islamabad Dr. Prof. Masoom Yasinzai, Dr. Qasim, scientists, PhD students of science subjects, representatives of all stakeholders, academia, government organizations, general public and media persons.

In his welcome address, President of the Academy Dr Anwar Nasim informed the audience about the history and functions of the academy. He said that the idea of establishing Pakistan Academy of Sciences was mooted in November 1947 at the 1st National Educational Conference held at Karachi.



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encourage science and technology subject at school level as this would be an effective way to provide a strong base for this subject.

Endorsing this proposal, President ECOSF Dr. Soomro explained that that in his capacity as Chairman Pakistan Science Foundation he already had launched an initiative to engage schools in different activities regarding science and technology popularization. He also said that under this programme, the PSF had organized speech contests, posters competitions

technology.

Sayed Paras Ali, Editor Technology Times, noted with concern that scientists remain shy of writing articles or research documents for print media, which is the main factor that general public do not have understanding about our advancements in science and technology.

He also suggested that there is a dire need to bridge the gap between scientists' community and media persons saying it would help a lot in the latter's capacity building and under-

Protective Measures

- The sequence of activities to achieve a reasonable level of preparedness includes:-
 - Awareness and Training
 - Detection and Evaluation
 - Personal Protective Measures
 - Shelters and Command Posts
 - Decontamination/ Quarantine
 - Emergency Response

CONCLUSION

- Likely threat can emerge from:-
 - Non-State Actors
 - Accidental release Bio agents
- Pakistan has set up strong national institutions and observes stringent measures, within available resources
- Effective and comprehensive legislations, and efficient administrative measures are in place for dealing with any untoward incident of Bio threats
- International Cooperation and Transfer of Technology require attention and will compliment and support national actions

Thank You

Especially Jo Husbands; Daniel FEAKES

Oleksandr Kapustin; Hermann LAMPALZER et al.