



## Proceedings of the MAAP-PAS-ANSO Hybrid Workshop on "Ecosystem Restoration: One-Health and Pandemics"

Asiya Nawaz<sup>1</sup>, Naveera Khan<sup>1</sup>, Hanbal Ahmad<sup>1</sup>, Irum Iqrar<sup>2</sup>, Muhammad Ali<sup>1,2</sup>,  
and Zabta Khan Shinwari<sup>2,3</sup>

<sup>1</sup>Department of Biotechnology, Quaid-i-Azam University, Islamabad

<sup>2</sup>Pakistan Academy of Sciences, Islamabad

<sup>3</sup>Department of Plant Sciences, Quaid-i-Azam University, Islamabad

### OVERVIEW

Humanity is currently dealing with a number of interlinked existential crises. Ecological degradation, climate change, and biodiversity loss have disastrous consequences for human health and well-being. Furthermore, the emergence and transmission of zoonotic diseases like COVID-19 are linked to ecosystem health. For example, zoonotic infections account for ~75% of new infectious diseases, and they are mainly caused by unsustainable resource usage, animal factory farming, and other large-scale anthropogenic influences. As these pandemics show, environmental destruction can play an important role in a worldwide public-health crisis. It is commonly agreed that COVID-19 will not be the last pandemic. We need holistic approaches like One Health (an area of research that recognizes human, animal, and ecological health as interconnected). One health seeks to increase communication and collaboration between humans, animals, and environmental health professionals to prevent the spread of diseases. To shed light on this important topic, "Ecosystem Restoration: One-Health and Pandemics; hybrid workshop" was organized by the Pakistan Academy of Sciences (PAS) and Monbukagakusho-MEXT Alumni Association of Pakistan (MAAP); and sponsored by the Pakistan Academy of Sciences (PAS) and Alliance of

International Science Organization (ANSO) on June 5, 2022. More than 150 participants attended the hybrid workshop.

### 1. BRIEF INTRODUCTION

World environment day is celebrated on 5<sup>th</sup> June every year to bring awareness among the masses about the importance of environmental conservation. This year the slogan for this day was "Only one Earth" which means that we have only one planet to live on and we need to live sustainably in harmony with nature. To celebrate world environment day, a hybrid workshop on "Ecosystem Restoration: One-Health and Pandemics" was organized by the Pakistan Academy of Sciences (PAS) in collaboration with the Alliance of International Science Organizations (ANSO) and MEXT Alumni association of Pakistan (MAAP). The theme of this workshop emphasized on connecting human, animal and environmental health in a balanced way so that none of them is undermined because the human-health is closely connected to the health of animals and our shared environment. The resource persons in the workshop were leading foreign experts from different countries i.e., USA, UK, Japan, China, and Pakistan. They shared their views and their research outputs and discussed development in the area of one health and pandemic. This workshop included two technical sessions.

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\*Corresponding Author: Muhammad Ali <alibiotech01@gmail.com; muhammad.ali@qau.edu.pk>

## 2. INAUGURAL SESSION

The Chief Guest of the inaugural session of the hybrid workshop was Prof. Dr. Khalid Mahmood Khan (President, PAS). Moderators of the two technical sessions were Prof. Dr. Muhammad Mukhtar (Vice Chancellor, National Skills University (NSU), Islamabad) and Dr. Shaukat Hameed Khan (Fellow PAS & Ex-Coordinator General COMSTECH).

**Prof. Dr. Zabta Khan Shinwari (Chief Organizer, Fellow PAS & President MAAP)** was the moderator of the Inaugural Session. Prof. Zabta Khan Shinwari expressed his warm appreciation to the members of the organizing committee, speakers, the Pakistan Academy of Sciences, and especially ANSO for their collaboration to organize this hybrid webinar. Prof. Dr. Tasawar Hayat (Secretary General PAS) welcomed all the guests, speakers, organizers, and workshop participants. He appreciated all the efforts of MAAP, PAS, and ANSO to organize this series of webinars and emphasized on organizing other similar webinars/events in the future.

**In the Inaugural Address, Prof. Dr. Khalid Mahmood Khan (President PAS)** shared his views about the importance of a healthy ecosystem

and that one health has changed the conventional approach that only human health is of prime importance. He supported this idea by sharing the fact that a major portion of human infectious diseases are of zoonotic origin. Environmental changes and anthropogenic factors are exacerbating the problem of ecological imbalance. He highlighted the challenges and loopholes in managing the current pandemic (Covid-19) and advocated the need for strong collaboration among the scientific community and state institutions.

## 3. TECHNICAL SESSION I

Technical Session I was chaired by **Prof. Dr. Muhammad Mukhtar (Vice Chancellor, National Skills University, Islamabad)**. The first speaker, **Prof. Dr. Zabta Khan Shinwari** briefly explained “Biodiversity loss: One health and pandemic.” He elaborated the grave concern of biodiversity loss and stressed on its conservation by quoting “No one is safe until everybody is safe”; which highlights the importance of timely holistic actions to regulate animal trade and conserve wildlife biodiversity. He also considered Covid-19 a blessing in disguise as it has given us a wake-up call to take measures for environmental protection so that we could avoid such lethal pandemic(s)



**Fig. 1.** Participants of Inaugural Session of MAAP-PAS-ANSO Hybrid Workshop on Ecosystem Restoration, One-Health and Pandemic with the Prof. Dr. Tasawar Hayat (Secretary General PAS), Prof. Dr. Muhammad Mukhtar (Vice Chancellor, National Skills University (NSU), Islamabad), Dr. Shaukat Hameed Khan (Fellow PAS & Ex-Coordinator General COMSTECH), and Prof. Dr. Zabta Khan Shinwari (Chief Organizer, Fellow PAS & President MAAP) organized by the Pakistan Academy of Sciences (PAS) and Monbukagakusho-MEXT Alumni Association of Pakistan (MAAP); and sponsored by the Pakistan Academy of Sciences (PAS) and Alliance of International Science Organization (ANSO)

again, or at least could prepare ourselves for any environmental degradation of a lesser degree.

**Prof. Nancy Connell (US-NAS)** (The National Academy of Sciences, USA) introduced a very emerging domain of technology Artificial intelligence (AI) that can be incorporated into the field of biological conservation. The topic of the talk was “AI and biodiversity”. As she started with a very powerful quotation by E O. Wilson “If there is danger in human trajectory, it is not so much in the survival of our species as in the fulfillment of the ultimate irony of organic evolution: that in the instant of achieving self-understanding through the mind of man, life has doomed its most beautiful creations.” She presented the highlights of her research project that how they have used artificial intelligence to monitor and regulate biodiversity, and also in the improvement of conservation and sustainable use of biological and ecosystem values in a rapidly changing and resource-limited world.

**Dr. David R. Franz (US-NAS)** elucidated the importance of insurance policy for the future in a rapidly changing and complex world to alleviate the effects of future pandemics. He stressed the idea by saying that “the planning is more important than the plan”. The topic of his presentation was “Insurance policy for the future” he mainly elaborated the drawback of human behavior that forgets the harsh past without doing anything to save the future generation. His presentation mainly consists of how we can focus on the one health concept that can improve the living conditions of both humans and animals with aid of science and technology. Lastly, he emphasized imposing a national strategy to countermeasure any future pandemic.

**Dr. Tim Trevan** (Co-founder, Chrome Biorisk management consulting) talked about “Zoonosis: Can we mitigate risks species jumps”. He stated that zoonosis is the evolution in action, and evolution requires replication that is further enhanced by selective pressure. In his lecture, he explained the stages of viral replication such as attachment, penetration, synthesis-coating, release, genomic assemblage, and finally viral protein synthesis. Further, he stated that there is no evolution possible without selective pressure, and no selective pressure is possible without replication. Such evolution and selective pressure can lead to pathogen spillover

and viral propagation.

**Dr. Niriyoshi Shinomiya (President, National Defense Medical College, Japan)** talked about the “Advances in the life sciences and the risk of pandemics”. He also put forward the highlights of research projects on the possibility of artificial synthesis of various viruses and expressed concern that the eradicated viruses such as the smallpox virus can reemerge due to its chemical synthesis. Prof. Niriyoshi Shinomiya also highlighted the need for and importance of biosafety and biosecurity with the installation of biological safety levels in labs worldwide. His presentation further contains a timeline of the human warfare threats that shows traditional agents during the 1970s, genetically modified traditional agents during the 1990s, and synthetic biology recombinant genetics and genome editing after the 2000s. Additionally, he also illustrated trends in life science technologies from the past twenty years and emphasized on regulating technologies like genome editing, etc.

#### 4. TECHNICAL SESSION II

Technical Session II was chaired by **Dr. Shaukat Hameed Khan (Fellow PAS & Ex-Coordinator General COMSTECH)**. The first speaker of the second session was **Dr. Muhammad Ali (Principal investigator, ANSO Project & Assistant Professor, Quaid-i-Azam University Islamabad)** who gave a brief overview of “Bats viruses and Pandemics”. He discussed that bats are one of the largest reservoirs of mammalian viruses due to their migratory behavior, seasonal hibernation & roosting, altered antiviral immunity, and unique anti-inflammatory and proinflammatory responses. Some of the bat-borne viruses have spread to the human population by crossing specie-barriers. He gave an overview of global ongoing research on bat viromes and discussed current challenges. In concluding remarks, he emphasized the need for close and apolitical collaborations among scientists in combating pandemics.

**Dr. Qadeer Ahsan (Fleming fund)** discussed the pandemics with respect to Pakistan. He emphasized on that antimicrobial resistance aggravated the covid-19 pandemic situation. He discussed the role of the Fleming Fund to improve the AMR surveillance and support a national

action plan to transform policy and delivery of healthcare in Pakistan. He also discussed the clinical stewardship program initiated by the Fleming fund and highlighted its main objectives. He also emphasized on laboratory infrastructure enhancement, federal and provincial interventions, system development, and disease surveillance. He also mentioned the results of the knowledge attitude and practice (KAP) survey.

**Dr. Quaid Saeed (CEO, Islamabad Healthcare Regulatory Authority; IHRA)** shed light on the role of IHRA in the management of the Covid-19 pandemic. In his message, he discussed different strategies that were adopted by them to cope with emergencies. He also discussed that health regulatory authorities like IHRA are under pressure during the pandemics for taking urgent and important decisions regarding controlling the pathogen, vaccine approvals/strategies, and regulating healthcare-related issues. IHRA managed the complaints from the masses regarding malpractices by the hospitals and diagnostics facilities.

**Prof. Dr. Li Cui (Institute of Urban Environment, CAS)** briefly explained her research projects on antimicrobial resistance and one health. She focused on the environmental dimension of antibiotic resistance and reservoirs of AMR that are neglected somehow. Initially, she explained the general concept of antibiotic resistance, followed by the severity of global antimicrobial resistance and how it leads to a silent pandemic by slowly ending millions of lives worldwide. She elaborated that one health is essential not only to avoid any future pandemic but also to the major threat of antibiotic resistance. She stated that increased contact of humans with wild animals can enhance antibiotic resistance and transfer these into the food chain which can affect the primary and secondary consumers in the food chain.

Following **Dr. Li Cui, Dr. Shahbaz Khan (UNESCO, Beijing)** presented the concept of open science for all-leaving no one behind. The implementation of this idea needs a transparent, inclusive, democratic, and sustainable approach. Research findings should be more accessible, and for that, we need open communication, open knowledge, shared research, infrastructure, open

labs, crowdsourcing, crowdfunding, etc.

Lastly **Prof. Lijun Shang and Prof. Malcolm Dando** (London Metropolitan University, UK) talked about the topic “Is there sufficient educational resources for the implementation of Tianjin Biosecurity guidelines for codes of conduct for life scientist result and survey” in their presentation of some of the backgrounds that leads to the development of the Tianjin biosecurity guidelines. That includes education and training and how it is promoted by Pakistan and China relationship.

## 5. CONCLUDING SESSION

The Chief Guest of the concluding session was **H.E Ryuji IWASAKI**, Counsellor, **Embassy of Japan** in Pakistan with a take-home message on the importance of environmental preservation and how it is essential for us, and how by adopting Ecosystem restoration: One health and pandemic approach to not only prevent outbreaks in zoonotic diseases, but also the other environmental issues including food safety and antimicrobial resistance. Furthermore, it's a collective responsibility of all different government and non-government organizations to address the challenges through the engagement of society and the research community along with the introduction of new policies to mitigate these threats for the future generation.

In total, 11 lectures were presented by eminent local and foreign speakers in two technical sessions of the hybrid workshop while a concluding message was presented on behalf of Dr. Fazal Hadi, Chair Board, Islamabad Healthcare Regulatory Authority by Dr. Shaukat Hameed Khan (Fellow PAS & Ex-Coordinator General COMSTECH).

*“The health of the planet impinges on all the living creatures, flora, and fauna. Recent events have proved that we are knowingly and unknowingly damaging the environment of our planet at a fast pace. We are nearly on the brink of no return. There is hardly any time left. Very urgent steps are needed on a war footing. The industrialized world is largely responsible. It has a voracious appetite for the resources of the world, which are finite. They know this but continue their quest for fast profits. They think they will somehow escape. They will not be able to! We the present generation on this planet are*





**Fig. 2.** Participants of Concluding Session of MAAP-PAS-ANSO Hybrid Workshop on Ecosystem Restoration, One-Health and Pandemic with the Chief Guest H.E Ryuji IWASAKI, Counsellor, Embassy of Japan in Pakistan, Prof. Dr. Tasawar Hayat (Secretary General PAS), Dr. Shaukat Hameed Khan (Fellow PAS & Ex-Coordinator General COMSTECH), and Prof. Dr. Zabta Khan Shinwari (Chief Organizer) organized by the Pakistan Academy of Sciences (PAS) and Monbukagakusho-MEXT Alumni Association of Pakistan (MAAP); and sponsored by the Pakistan Academy of Sciences (PAS) and Alliance of International Science Organization (ANSO)

*leaving a terrible legacy for our future generations, whose fate is in serious jeopardy anyway. Outbreaks of new diseases, never seen before, are on the increase. Pandemics are becoming common. The human and financial costs of these cannot be estimated in real terms. Human greed bent upon the destruction of a hitherto untouched and pristine environment is playing havoc with the lives of all living beings. The only way to stop all this is to get together again and again to devise ways and means and to monitor them, to put a stop to this madness of wanton destruction of our planet, the only one we have."*

The session was concluded by Prof. Dr. Tasawar Hayat (Sec. Gen. PAS). He expressed his gratitude to worthy Chief Guest H.E Ryuji Iwasaki for sparing his precious time to grace this Workshop. In addition, a few posters were also presented by participants of the workshop. "For this, I am indebted to all the speakers of the workshop for their thought-provoking lectures on a broad range of topics in line with the themes of the workshop and for fruitfully sharing their knowledge and expertise for the benefit of the participants of the workshop. We must, therefore, give a big round of applause to all the local and foreign faculty members and

poster presenters" he added. Secretary General also appreciated and acknowledged the speakers, moderators, organizers, and participants of the workshop and especially thanked ANSO for its financial support. To acknowledge the contributions of the speakers, the PAS presented Souvenirs to those speakers and moderators who were physically present at the venue.

## 6. CONCLUSION

This workshop provided a platform for a wholesome discussion on ecological restoration and presented some robust solutions and conceptual frameworks that could be very helpful to address the existing ecological crises. One health approach can be a very effective strategy to cope with the disastrous effects of an imbalance between humans and the environment and deadly pandemics that sprout from the critical nexus of human beings and the ecosystem.

## 7. ACKNOWLEDGEMENT

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