

# Newsletter

## PAKISTAN ACADEMY OF SCIENCES

*Promoting Science, Technology and Innovation for Socio-economic Development*

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COVID-19 (Corona Virus) is declared as 6<sup>th</sup> public health emergency services by the World Health Organization (WHO) that has affected more than 209 countries including Pakistan. Keeping the dense population of Pakistan, the Government of Pakistan and Health Ministry implemented Standard Operating Procedures (SOPs) by designing quarantine centers, testing facilities, and complete lockdowns. Due to this strict social distancing, all academic activities were on pause for almost 4-5 months. There are still doubts about arising the second wave in Pakistan and we need to comply with the SOPs strictly hoping for the best to defeat this malignant virus. However, PAS continued its academic and scientific activities through webinar and online meetings.

### PAS Co-organized a Webinar on COVID-19 and Open Science with the UNESCO, Islamabad (May 11, 2020)

#### PANELISTS



Patricia McPhillips  
Representative/Director  
UNESCO Islamabad



Prof. Qasim Jan  
President  
Pakistan Academy of  
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Dr. Tariq Banuri  
Chairman  
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Dr. Shahbaz Khan  
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UNESCO Jakarta,  
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Maj Gen Aamer Ikram  
Executive Director  
National Institute of  
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Biological Safety  
Association



Prof. Zabta Shinwari  
Vice Chair  
World Commission on  
Ethics of Science  
Knowledge and  
Technology



Prof. Saeed Khan  
Focal Person  
COVID-19,  
Dow University of  
Health Science

The Pakistan Academy of Sciences (PAS) in collaboration with The United Nations Educational, Scientific and Cultural Organization (UNESCO) hosted a webinar on COVID-19 and Open Science (as a follow up to the UNESCO Virtual Online Ministerial Dialogue on COVID-19 and Open Science) on May 11, 2020. A group of panelists headed the event namely; Ms. Patricia M. Philip, Director UNESCO; Prof. Dr. M. Qasim Jan, President Pakistan Academy of Sciences (PAS), Islamabad; Dr. Tariq Banuri, Chairman Higher Education Commission (HEC); Major. Gen. Aamer Ikram, Executive Director (ED) National Institute of Health and Sciences; Prof. Dr. Zabta Khan Shinwari Vice-Chair World Commission on Ethics of Science Knowledge and Technology (COMEST); Dr. Shahbaz Khan, Director UNESCO Jakarta (Regional Science Bureau for Asia and the Pacific) and Prof. Saeed Khan, Focal Person COVID-19, Dow University of Health Science. These experts recommended actionable areas through an engendered, animated, and constructive deliberation.

This webinar resulted in producing "Islamabad Statement for Action on Open Science". The Islamabad Statement for Action reaffirms that, Open Science will bring together scientific research and innovation communities across the nation in strengthening the interface between science and society for evidence based policy actions for managing major challenges such as COVID-19. World wide, researchers and technology developers, engineers, academia, innovators, from private and public sectors, have been embracing the open science concept for making data and scientific knowledge more accessible, with the aim of leaving no one behind. Linkages between knowledge systems, the 'hard core science' and citizen science are critical for ensuring that 'no one is left behind' and are steering science to deliver solutions for major challenges facing society. In the case of Pakistan, open science can help bridge divides between advanced research institutes and emerging centres of excellence in academic and private sectors. It can also bring much needed emphasis on south-south cooperation for sustainable development through better accreditation of qualifications and peer reviewed research. The unique mobilization of the world's scientific community during COVID-19 is a testimony of increasing value of 'open science' without borders through political leadership. The implementation of open science approach enforces the basic human right of access to scientific knowledge.

# Commonwealth academies statement on climate change, biodiversity and sustainable energy (June 5, 2020)

Prof. Dr. M. Aslam Baig (Secretary General, PAS) and Prof. Dr. M. Qasim Jan (President, PAS) participated in the commonwealth academy teleconference on April 28, 2020. As a follow up, the Commonwealth academies statement on climate change, biodiversity and sustainable energy was published on World Environment Day on Friday June 5, 2020, which mark an important point of reference and as we go forward into an important year for action on climate and biodiversity. The statement is as follow;

COVID-19 has had a profound impact across the globe, affecting health and health services, impacting the global economy, and exacerbating social and economic inequalities. Global cooperation and effective policy are essential for tackling the virus and for ensuring a successful economic recovery. But the global pandemic does not change the fact that the world also continues to face an ever-growing environmental emergency. Indeed, COVID-19 has highlighted the importance of governments working together and we must build on this global response to address the climate crisis.

On the occasion of World Environment Day, and in a month when Commonwealth leaders would have gathered in Kigali for the Commonwealth Heads of Government Meeting (CHOGM), we therefore call on governments to continue to address the joint challenges of climate change and biodiversity loss, and to ensure that global economic recovery from the pandemic is environmentally sustainable across the Commonwealth and globally. Delivering action on the urgent and interlinked challenges of climate change, biodiversity loss and sustainable energy provision presents economic, social and environmental opportunities for the whole Commonwealth.

We call on Commonwealth Heads of Government to:

1. Use the opportunities of COP26 and COP15 to coordinate discussions on the joint challenges of climate change and biodiversity and recognise their inherently interlinked nature.
2. Work with the global research community to identify scientific and holistic approaches for addressing climate change and biodiversity without causing unintended damage.



Prof. Dr. M. Aslam Baig  
Secretary General, PAS

Prof. Dr. M. Qasim Jan  
President, PAS

3. Grasp the opportunity of a decarbonised economy and its benefits for people and life on Earth.

4. Ensure a resilient and environmentally sustainable recovery from COVID-19.

The wellbeing of people across the world has improved significantly over the last century. In particular, a reduction in poverty levels, improved technological advancements, and expanded educational and economic opportunities have increased living standards for many – both across the Commonwealth and globally.

However, these improvements in human development have come at a cost and there has been a huge impact on climate change and biodiversity. Global temperature increases are now predicated to be significantly higher than 1.5°C above pre-industrial levels on current emissions trajectories. Governments face additional challenges in seeking to limit additional warming beyond these levels.<sup>1</sup> These increases in global temperature will be associated with an increase in the occurrence of extreme weather events at the local, regional and global scales. Current extinction rates of known species are at an all-time high, and the abundance of wild organisms is declining worldwide across all observed groups, including fish, corals, birds, mammals, insects, amphibians and plants. This has both a significant impact on ecosystems, the services they provide to humanity, such as food, pollination, and water purification, and to resilience to climate change hazards, such as the prevention of flooding, the mitigation of storms and resistance to novel pests and diseases.



These changes are already well underway. Failure to tackle these combined challenges in the increasingly narrowing timescale required will pose significant risks to human development and welfare, societal inequalities, and impact all Commonwealth countries, particularly those that are most vulnerable. Governments must therefore take urgent action to address these issues.

Taking these actions now creates strong opportunities for human development within Commonwealth countries. These include: delivering sustainable economic growth in high-productivity sectors and providing cheap, clean energy to off-grid communities; improving public health by addressing the adverse impacts of climate change and biodiversity loss; and greater public engagement through empowering local communities and future generations.

In all cases, careful planning and action is needed and this requires movement now, including further

research to narrow uncertainties where they remain large; work to translate research and development solutions into policy; and global leadership - which has been clear, but not yet met with the necessary scale of action – across the Commonwealth and beyond.

This decade, the Commonwealth has the opportunity to capitalise on its diversity and scale, and the potential of its young and growing population, to deliver a sustainable and prosperous future. In order to address these critical challenges, the Commonwealth and its member countries will need to work with the other countries of the world – particularly those with the highest political and economic influence such as China, the USA and others – and to call on them to support these essential endeavours. The academies of the Commonwealth stand ready to assist in these crucial efforts, through using our collective knowledge, experience, expertise and convening power to support the necessary action required.

## **Representation of Pakistan Academy of Sciences in AASSA Working Group Meeting on Climate Change and Health (June 17, 2020)**

The AASSA Working Group on Climate Change and Health met by zoom on June 17, 2020 and included participation from Malaysia, Australia, China, India, Korea, Nepal, Pakistan and New Zealand. Last year, Pakistan Academy of Sciences (PAS) nominated Prof. Dr. M. Perwaiz Iqbal (Fellow PAS and Professor, Department of Life Sciences, University of Management and Technology, Lahore) to represent the Pakistan Academy of Sciences (PAS) in the InterAcademy Partnership (IAP) and the Associations of the Academies and Societies of Sciences in Asia (AASSA) project titled Climate Change and Health. In the first meeting of Kuala Lumpur, Malaysia held on Feb 24-25, 2020, Prof. Dr. M. Perwaiz Iqbal was assigned with the task to write a country report on the Effect of climate change on health in Pakistan. Excerpts from this report would be used in the final report of IAP that is expected to be published in the year 2021.

This report highlights the emerging global issue of climate change, that has been in the lime light for more than 4 decades and response of the world bodies including the World Health Organization (WHO, Inter-Academy Partnership (IAP) to aware the member countries in order to save the future generations from the devastating effects of climate change.



**Prof. Dr. M. Perwaiz Iqbal (FPAS)**

Pakistan, is listed among the top 10 most affected countries of South Asia due to climate change. The adverse effects due to this has resulted into erratic weather patterns, reduction in availability of clean water per capita, melting of glaciers, desertification of fertile cultivable land, flooding, land sliding and drought leading to food insecurity, water-borne diseases.

It is hoped that the world during the post-pandemic period would be more conscious of the mitigation steps to be taken to prevent the future generations from the ill-effects of climate change. In other words, the world needs a “climate smart” stimulus to provide a safe and healthy environment to future generations.

## Representation of Pakistan Academy of Sciences in AASSA Webinar on National Academy's Response to COVID-19 (July 10, 2020)

The Associations of Academies and Societies of Sciences in Asia (AASSA) Secretariat, in collaboration with the Korean Academy of Science and Technology (KAST) held a virtual webinar on National Academy's Response to COVID-19, on July 10, 2020.

Prof. Dr. Yoo Hang Kim, President AASSA welcomed the participants in his opening remarks and appreciated the participation of the panelists from various science academies. He further, added the objective of this gathering as an experience to share their efforts and initiatives in devising a successful exit strategy.

Being a member of the National Academies of Sciences (NAS), the Pakistan Academy of Sciences (PAS) nominated Prof. Dr. Zabta Khan Shinwari, Fellow PAS to present a list of activities performed by the Academy during this global pandemic.

Prof. Dr. Zabta Khan Shinwari presented a paper to highlight these activities including; International liaisons, Relief efforts to the humanitarian victims, suggestions to the Government in policy documents for COVID-19, usage, and importance of traditional medicine to combat the virus, and awareness training, sessions, and seminars with stakeholders, experts, and researchers within Pakistan and outside the country.



## Prof. Dr. Fazal A. Khalid, FPAS Organized an Online Webinar on Research and Knowledge-Economy, Role of Universities: Challenges and Opportunities (July 16, 2020)

An online webinar was organized by Prof. Dr. Fazal A Khalid, Fellow PAS, Chairman, Punjab Higher Education Commission (PHEC) on Research and Knowledge Economy Role of Universities: Challenges and Opportunities on July 16, 2020. This webinar was attended by the Vice-Chancellors of approximately 50 public and private sector universities of Punjab.

Prof. Dr. Atta-ur-Rahman *FRS*, Fellow PAS was invited as a keynote speaker. In his keynote remarks, Prof. Dr. Atta-ur-Rahman stated that universities are a hub of creative ideas, that correlates with the economy of a country. Moreover, he emphasized on the research and its best model practices (of the advanced countries) are required to follow by the Pakistani Universities.

Prof. Dr. Fazal A. Khalid, the organizer of this program acknowledged Prof. Dr. Atta-ur-Rahman *FRS* and all vice-chancellors for their participation and time.

Further, he highlighted the contributions of the Punjab Higher Education Commission (PHEC) towards the knowledge and economy with a provision of training, funding for conferences and seminars, and international travel grants for the faculty members, researchers, and senior management.





# PAS Agriculture Webinar Episode 1 Entitled “Prevailing Wheat Crises and Future Pathways/Policy Brief (July 25, 2020)”

A virtual event titled Prevailing Wheat Crises and Future Pathways was arranged by Prof. Dr. Iqrar A. Khan (FPAS) in collaboration with the Pakistan Academy of Sciences (PAS) on July 25, 2020. This Webinar Episode was designed to chart the future pathways for critical intervention to break the stagnation. There were 123 participants from 8 countries, logged in for two hours in the session chaired by the Federal Minister for Food Security and Research, Syed Fakhar Imam. The session was opened by Syed Yawar Ali, Chairman Nestle, stressing a need for genetic improvements. Out of three elements (genetics, seed technology and agronomy) two were explored. The Keynote speakers Dr. Kanwarpal Dhugga (CIMMYT) and Dr. Kulvinder Gill (WSU) made an elaborate case on the genetic improvement and variety replacements. The two discussants were Dr. Abid Mahmood and Dr. Anjam Ali Butter, DG Agriculture Research and Extension, respectively. After a Q/A segment, the session was concluded by the Federal Minister.

As a summary of the event, following pathways were identified as strategic policy outline for breaking the wheat yield stagnation:

1. The stagnation can be effectively overcome with the introduction of genetically improved varieties at the farm level, which is currently a far cry. The national average is less than 2/3rd of the progressive farmers in the country and a quarter of the realizable potential;
2. Prospects of continuous wheat genetic improvement are bright. Breeders are continuously discovering new genes and employing new techniques to introgress genes from within the wheat relatives and across the phylum. However, releases of varieties in quick succession needs to be discouraged;
3. Transgenic wheat offers highly attractive solutions. However, the regulatory environment and public perception are unfavorable. One can predict a possibility of changing demand side and opportunity for the introduction of transgenic wheat. The regulatory framework in the country is still ineffective and unprepared for such an eventuality. Yet, there is an opportunity in the crisis;
4. The NARS breeding programs need to be made more cohesive, allowing for a better collaboration with the international partners. A better coordination between the country office of CIMMYT and national breeding programs is desired;



5. The Gene Shifters (a company associated with WSU-Washington State University, Pullman) is willing to share the newly discovered genes and breeding materials;
6. The breeders need to emphasize breeding for low input responsive varieties. Nitrogen Use Efficiency (NUE) has been an important breeding objective to minimize ground water pollution, while cutting the cost of production;
7. An effective seed supply chain has to be created which is convenient and affordable for the ordinary farmer. The piloted programs of the government must translate into SMEs to create a wheat seed business and not as a continuous subsidy. The farmer must be educated and facilitated to reach out for new seeds;
8. The WSU example of collaboration between the breeders and seed business needs to be studied for incentivizing the private sector to play a role in the wheat seed supply chain;
9. Developing wheat hybrids is a potential course of action to create a seed industry where profitability becomes a key performance indicator for the seed producer and the buyer. However, there is a reservation that hybrid seed could be unaffordable by the small farmers; and
10. The agronomic practices must be optimized for a better harvest of wheat from the currently available varieties.

The audio/video recording of the event is available at the webpage of PAS [www.paspk.org](http://www.paspk.org) and at the YouTube link: <https://youtu.be/Evkudj7UiQYk>

# PAS Agriculture Webinar Episode 2 Entitled “Precision Agriculture and Sustainable Solutions/Policy Brief (July 30, 2020)

Prof. Dr. Iqrar A. Khan in collaboration with Pakistan Academy of Sciences (PAS), Pakistan Institute for Developmental Economics and CAS-D at University of Arid Agriculture, Rawalpindi organized a zoom Agriculture webinar episode 2 entitled “Precision Agriculture and Sustainable Solutions” on 30th, July 2020 at 04:00 PM PST.

This episode was organized to understand the potential of precision applications and to engage the stakeholders for fast tracking the precision agriculture agenda. A 150 minutes session was attended by 155 participants logged in from 10 countries. Notably, the President Engineering Council of Pakistan, Mr. Javed Qureshi also attended this meeting. The Federal Minister for Food Security and Research-Syed Fakhar Imam addressed the webinar and emphasized precise use of inputs, particularly water. He also eluded to the technology applications in the full value chain of commodities.

There was a very active audience asking relevant questions. The most important question pressed by the audience was how to make precision agriculture and digitization relevant to the farming community of Pakistan where farm holdings are small. In his remarks, Dr. Kauser Abdulla Malik reminded the house of making use of locally manufactured laser levelers as one of the key elements in precision agriculture. Mr. Khalid Khokhar, President Kissan Itehad emphasized introduction of tillage practices to improve the organic matter contents of our soils under very intensive cultivation practices. As a representative of the Farmers Association of Pakistan, Malik Afaq Tiwana suggested packaging of available digital technologies i.e. laser levelling, remote sensing, auto-steering and drones. He also explained a service providers model currently piloted by the Habib Bank Limited where farmers profits have gone up highly significantly in the corn crop harvested last spring. The rice plant population has been doubled with machine transplanting offered by a service provider. However, creation of service providers for each commodity is needed. There is no single model suitable for all crops and farm categories. Out of box solution are to be practiced to make precision enabled mechanization (not just tractors) reach at all farm levels.

As a summary of the session, following observations and strategic policy recommendations have emerged:

**Precision Agriculture and Sustainable Solutions**  
In Collaboration with Pakistan Academy of Sciences, Pakistan Institute for Developmental Economics and CAS-D at University of Arid Agriculture Rawalpindi

30th July 2020  
4:00PM PST  
Zoom Agriculture Webinar, Episode 2

**Moderator**  
Dr. Iqrar Ahmed Khan,  
Professor Emeritus,  
University of Agriculture,  
Faisalabad

**Panel**  
Prof. Dr. Qamar Uz Zaman  
Vice Chancellor, PMAS-  
UAAR  
Malik Afaq Ahmad  
Tiwana  
CEO, Farmer's Associate  
Pakistan

**Speakers**  
Dr. Travis Essault  
Assistant Professor  
Dalhousie  
University, Canada  
Dr. Son Ok Chung  
Professor,  
Chungnam National  
University, South Korea  
Dr. Waqar Shahid Qureshi  
Assistant Professor  
NUST, Islamabad  
Dr. Azeem Khan  
Researcher  
University of New  
England, Australia  
Dr. Altaf Ahsan  
Farooque  
Associate Professor  
University of Prince  
Edward Island, Canada

Media Partner:  
China Economic Net

1. Farm Mechanization in Pakistan is grossly insufficient and obsoleted. While the numbers must rise, it is time that that happens with a higher horsepower and available digital applications;
2. Realizing the limitations of the small farmers, the service providers option has to be made possible. That can only happen through a major investment strategy where public expenditure could incentivize private investment (credit) and entrepreneurship;
3. Most of the current horsepower and mechanized operation needs are already in the domain of a service of kinds (rented tractors and harvesters). That has to evolve into a state-of-the-arts category combined with the input supply on the one end and to the market at the other end. A better integration of services and supplies can also create economy of scales;
4. The access to data should be made a public good. The data applications could be developed as business propositions (Apps). Investment in human resources should be tailored to achieve that goal including curriculum reforms;
5. The data science has applications across the disciplines. The new curriculum should be integrative and horizontal.
6. A legislative debate should take place to enact laws for transforming agriculture with a modern profitable outlook instead of oft repeated stories of compassion, sufferings and dole outs;
7. The prioritized precision applications include tractors with higher horsepower and farm equipment.

The audio/video recording of the event is available at the webpage of PAS [www.paspk.org](http://www.paspk.org), [www.uaar.edu.pk](http://www.uaar.edu.pk).



## Participation of PAS Fellows in 7<sup>th</sup> Science and Technology Exchange Program (STEP), Iran

Prof. Dr. M. Iqbal Chaudhary (Coordinator General, COMSTECH and FPAS) and Prof. Dr. Zabta Khan Shinwari, Fellows PAS participated as Panelist in the 7<sup>th</sup> Scientific and Technological Exchange program (STEP) virtual summit held on May 28, 2020.

The summit was co-organized by the Mustafa (PBUH) Science and Technology Foundation and ECOSF with the objective of providing a platform for the Islamic World Scientists and experts to solve the global pandemic (COVID-19) mutually.

Prof. Dr. Zabta Khan Shinwari, presented a talk on Scientific and Technological Networking in Facing the Coronavirus Challenges in the Islamic World. In his talk, he addressed COVID-19 research highlighting the: a) Emerging Areas in Biological and Health Sciences with Emphasis on Multidisciplinary Research (physics, chemistry, etc); b) Creation of an Organization of Islamic Cooperation (OIC) Biological Sciences network, establishing joint BSLIII and VI Labs and the focus on clinical trials on coronavirus patients

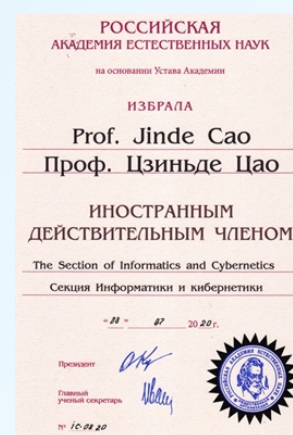
using the existing drugs like azithromycin, and oseltamivir; exploitation of herbal drugs and amplifying the testing facilities of Coronavirus in OIC.



## Prof. Dr. Jinde CAO, Foreign Fellow PAS Elected as a Foreign Academician of the Russian Academy of Natural Sciences

The Russian Academy of Natural Sciences elected Prof. Dr. Jinde CAO (Foreign Fellow PAS), as Foreign Academician for his fundamental contributions to the fields of the mathematical models, dynamic analysis, and control theory in various network systems with their engineering applications.

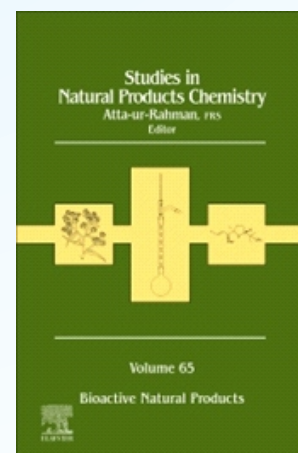
The President of the Russian Academy of Natural Sciences (RAEN), O.L. Kuznetsov awarded him a gold medal with a congratulation letter for his contribution to the development of RAEN.



## Prof. Dr. Atta-ur-Rahman FRS Fellow PAS, Published a Book in Elsevier June 2020

Prof. Dr. Atta-ur-Rahman FRS, Fellow PAS published the 65<sup>th</sup> volume of Studies on Natural Product (e-book ISBN Number: 9780128179062; hardcover ISBN: 9780128179055) under his editorship.

This volume has now become the most comprehensive encyclopedic series which covers the synthesis, chemistry, and biological activities of natural products derived from terrestrial and marine natural products.



## Dr. Sikander Azam (Member, PAS) and his Research Team identified Novel Vaccine Candidates against the Coronavirus

The researchers' team, under the supervision of Dr. Syed Sikander Azam (Member, PAS) from Computational Biology Lab at National Center for Bioinformatics, Quaid-i-Azam University (QAU) have identified novel vaccine candidates against Covid-19. The researchers utilized indigenously developed computational methods to design novel vaccine construct available at the Computational Biology Lab to identify the novel multi-epitope based vaccine candidates, said a statement issued by the University.

The study highlights the details of extensive computational experiments for identification of novel vaccine candidates through vaccinomics. Immunoinformatics approaches were utilized for the purpose of prioritizing potential vaccine candidates against COVID-19 considering their ease of use in further investigations, better delivery and efficient immune processing of epitopes. This study is recently published in a reputed journal "European Journal of Pharmaceutical Sciences." According to the published work, designing of vaccination strategies that target immune response focusing on these conserved epitopes could generate immunity that provide cross protection across Betacoronaviruses.



Dr. Sikander Azam (Member, PAS)

The promising computational findings might deliver preliminary epitopes set for a vaccine against the COVID-19. Meanwhile, probable prevention strategy discussed in this study for human beings to avoid becoming a reason for the extinction of various species either by hunting and/or over utilizing other mammals which could be a reason for resistance both from microbes and other animal species of this kingdom. Dr. Sikander further highlighted the presence of theory of retaliation and emphasized the need of strategic studies keeping in view the advancements in defense mechanism of avian and avian related microbes avenging humans.

### Obituary

#### Prof. Dr. Muhammad Ashfaq (1952-2020)

A resourceful Scientist, Prof. Dr. Muhammad Ashfaq, fellow PAS and the former acting Vice-Chancellor University of Agriculture, Faisalabad was born on November 16, 1952, in Jhang, Pakistan. He was elected as Fellow Pakistan Academy of Sciences in the year 2006.

Dr. Ashfaq has also been a pioneer in bringing a breakthrough in the sericulture industry of Pakistan by exploring the use of "Peepal" leaves for the silk worm rearing, as an alternate/supplement host plant.

He was decorated with the Best Scientist of Islamic World 2010 by the Organization of Islamic Countries, Civil Awards "Tamgha-i-Imtiaz" in 2003, Sitara-i-Imtiaz in 2013 and "Shield of Honour" by the President Islamic Republic of Pakistan.



Prof. Dr. Muhammad Ashfaq left this world in June 2020. He will be missed by the Fellows of the Pakistan Academy of Sciences.

May his soul rest in the highest place in Jannah. (Aameen).