Centre For Canadian Studies
In association with
Department of Finance and Business Economics
University of Delhi, South Campus

Conference

"COVID 19 and Issues of Urban Sustainability in India and Canada"

Funded by Shastri Indo-Canadian Institute

Highlights

Lectures by Eminent Experts from Canada, India, Europe and South East Asia.

Plenary Lectures by Dr. Randeep Guleria, Director, AIIMS, New Delhi; Dr. Harpreet Singh, Divisional Head, ICMR and Dr. Mahesh Verma, Vice Chancellor, Indraprastha University.

COVID Time Poetry recitation by world renowned poets from Canada (Dr. Cyril Dabydeen, Dr. Blaine Marchand and Dr. Laxmi Gill) and India (Dr. Rita Malhotra, Dr. Sanjukta Dasgupta and Dr. Anamika).

Lectures on International Perspectives in Public Health by international experts-- Dr. Marc Choisy (Vietnam), Dr. Olivier Telle (France), and Dr. Peter Patel (UK).

Lectures on the impact of COVID 19 on the Indian economy, business and environment by renowned experts—Dr. R. Nagaraj (IGIDR), Dr. Ram Ramaswamy (IIT), Shobha Mishra Ghosh (GE, Healthcare), Dr. M. K. Pandit (DU), Dr. Purnamita Dasgupta (IEG/ICIMOD) and Dr. Meeta K. Mehra (JNU).

Detailed Conference Report

INAUGURAL SESSION (10:00 am – 10:45 am)

Theme: "Managing the Pandemic Data: Challenges and Opportunities"

Welcome Note and Reading of Message from SICI Director: Prof. Yamini Gupt.

Introductory Note by Prof. Suman Kundu.

Chief Guest and Plenary Speaker: Dr. Harpreet Singh

***About Dr. Harpreet Singh**:* Dr. Harpreet Singh is a scientist and Divisional Head of Indian Council of Medical Research (ICMR), AIIMS, New Delhi with over nineteen years of experience in developing and managing accessible data systems. Dr. Singh obtained his PhD in bioinformatics from JNU and did his postdoctoral training at Cornell University. He is presently a scientist and is heading the division of Biomedical Informatics ICMR-AIIMS, Computational Genomics Center and Data Management Laboratory, ICMR, New Delhi, India. At ICMR, he is actively working on rationalizing data systems and incubated data platforms which he will talk about today.

Dr. Singh has led teams developing data portals for many programs of ICMR, such as ICMR Antimicrobial resistance surveillance network, Nikush for National Leprosy eradication program, I-Man for Implementation Research in mental health, et cetera. Dr. Singh has seventy- six peer reviewed publications and fourteen copyrights for developed tools to his credit.

Highlights of the Lecture: "We were trying to invent bullock cart but ended up inventing Ferrari," quoted Dr. Singh in reference to finding remedies for COVID. And in its essence, he structured his entire lecture to cover the various challenges and short-comings of the current pandemic management system and highlighted how our silent COVID heroes – the Data Scientists, who provided much needed data categorization and visualization and insights to various central and state government and health-infrastructure bodies throughout the pandemic, are developing solutions to keep us more prepared for the next probable health disaster. In his own words, "Challenges that we face and the actions that we take and the actions that are required," Dr. Singh mentioned that the overall outcome is based on the actions that we take today.

Dr. Singh started by laying down the fundamental foundation of ICMR, which is an apex body for formulation, coordination and promotion of medical research based out of ICMR's thematic research institutes which work on medicines and various other research programs that ICMR endorses and coordinates throughout the country. He said that of the 12 divisions, Biomedical Informatics is one which mandates the information support of medical researches. The division's objective is to develop accessible data systems and integrated research platforms. And as

availability of standardized and accessible data systems is one of the key challenges faced by ICMR, the division is trying to roll out integrated systems that communicate with each other and where data is easily accessible across platforms.

Narrating WHO's definition of a pandemic, Dr. Singh said that, ***"A pandemic is defined as an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people"***, and pointed out that the definition does not define the mode of transmission of the disease or the number of countries getting affected by it, something that integrated data can help map out.

Dr. Singh categorized data sources into two types:

1.**Primary Data Sources**– These contained data collected through surveillance of lab and hospital information systems, VRDL (Viral Research Diagnostic Laboratories), IDS, ICMR approved testing facilities, RT PCR application that monitors contact tracing and special surveillance.

2. **Secondary Data Sources** – These contained data which reflect the insights of the pandemic and are collected through AarogyaSetu app, quarantine monitoring information, transport management systems, mobile networks, social networks, essential services and user submitted information.

He mentioned the applications that a data management system can have:

1. Identification of an outbreak.

2. Understanding the spread and epidemiology of disease.

3. Identifying hotspots and multi-containment zones.

4. Contact Tracing and identifying vulnerable groups.

5. Developing guidelines.

6. Disease models and predictive analysis.

Dr. Singh mentioned two systems through which communication is facilitated between various data sources, both of which have been developed by ICMR.

1st system: National COVID kit validation system – As vendors import kits from international agencies and union members develop their own kits, this system keeps a track of this essential's flow in a transparent manner. As of now, approximately 750 vendors have been registered and 712 different kits have been validated and processed through the system.

2nd system: National COVID-19 Testing system – This indigenous system is centrally monitored and utilized by states and government institutions as well as private agencies to

continually update the number of people tested and the number of people contracting COVID in real time which has helped in the testing capacities from 100-200 tests per day to 1.5 million tests per day.

Dr. Singh mentioned that data sharing and access through communication with states and agencies is done through API, data dashboards and data visualizations and up until now, this structured data collection through Special Referral Form (SRF) has been updated 17 times over the past 1 year. These systems are currently integrating the vaccine data into their portfolio which again will help the agencies and government bodies in keeping a track of the general immunization of the population. He said that this system required a robust architecture to be able to handle the massive data inflow in a fail-safe manner and the team used an open-source platform to develop the system which helps maintain transparency. The system sources data from laboratories as well as geography-specific platforms and State-COVID apps that cater to a particular state. Dr. Singh mentioned that some laboratories are submitting their own data and taking back data from this pool to generate diagnostic trends.

The major challenge was communication between different systems. Dr. Singh mentioned that as each and every country had their own systems that were entirely different from WHO, the management and integration proved a big hassle. He said that epidemiologically, an epidemic is defined when increasing numbers cross a minimum threshold from the baseline. And as there are many epidemics that are going on such as pulmonary disorders, mental disorders and cardiovascular disorders, the government is getting quite serious about managing the data. And consequently, there are a lot of policy papers coming from the government that are forcing agencies to develop various architectures for data collection. One such policy is “National Data Sharing and Access Policy” from ICMR.

In continuation to the seamless connectivity of data systems, Dr. Singh said that ICMR has started a program called the Integrated Research Data Platform which is in its intermediate phase of development. This platform will essentially mitigate the different challenges faced between the communications of different data systems such as:

1. Diversity among the different data platforms.

2. Access to the data system by different agencies.

3. Integration of different data sources within these different systems.

4. Policy, which needs to be very strong and clearly defined.

5. Platform for integrating data analytics.

Dr. Singh mentioned that all the different agencies need to collaborate on a singular platform that will increase the efficiency of data sharing and treatment propulsions. Subsequently Dr. Singh suggested that if these challenges were to be worked on, it would be easier to control the next pandemic.

Technical Session I (11:30 AM-1:00 PM)

Theme: Socio-Economic Impact

Prof. Aditya Bhattacharjee chairperson for the first technical round is currently a professor at Delhi School of Economics. He has been the director of the Export-Import Bank of India. Prof. Bhattacharjee has been a visiting Associate Professor of Economics at Duke University. He is an alumnus of St. Stephen's College, University of Delhi and Jawaharlal Nehru University. He earned his M.Phil. from Queens' College, Cambridge and PhD from Boston University.

He started with a positive note acclaiming "*The worst is over and the stock market is booming*". The contraction in the current financial year will be much less than was anticipated only maybe 7-8 per cent, there will be a 'V'-Shaped recovery, attaining a double-digit growth in the next financial year and economic indicators are picking up in unexpectedly positive manner. The informal sector has been very badly hit since; we do not have good data on the sector it gets very little prominence. But whatever sources we have tell us it is still struggling many units are closed down and are unlikely to reopen. And many others are still struggling or deeply in debt. Unemployment peaked last summer and resulted in the tragic sight of millions of workers, trekking back to their villages. That seems to have recovered almost to the pre-Covid levels. But in terms of security, wages and working conditions the situation is not looking very promising for various informal services. The recovery is 'K'-Shaped some sectors and some professionals are recovering quite well and some are still deteriorating. Beyond that there are possible long term socio-economic impacts of the crisis especially in education. The long-term effects in terms of formation of human capital are actually quite disturbing since we don't know how long it will continue.

After his short introduction about the topic of the technical round he then introduced the two eminent speakers-- Prof. Ram Ramaswamy and Prof. R. Nagaraj.

Prof. Ram Ramaswamy is currently visiting professor of Chemistry at IIT Delhi. He has held several esteemed posts including Vice-Chancellor, University of Hyderabad and President of the Indian Academy of Sciences (2016-18). Prof. Ramaswamy is also a Fellow of the Indian National Science Academy and the Third World Academy of Sciences (TWAS).

He talked about his views on teaching in pandemic times. He claimed the world has been irrevocably changed by this virus, both in terms of recasting our priorities and also reawakening some other possibilities in all of us. The area of education is one which is drastically affected by the pandemic. The prevailing view of online education is that it hasn't really looked up to its

potential, and he remarked that this is even before the pandemic. Going fully online creates and widenssocial, economic and racial achievement gaps. Only 8 percent of homes with students have a reliable computer and internet connections and there are disparities in terms of Rural vs Urban, Gender, Economic levels etc. Under these circumstances most of the teachers in India have not recommended online teaching. The impact is that the quality of education has taken a serious hit because interaction between the teacher and student which is fundamental to the process of pedagogy has been adversely affected. At least 25 per cent students lose connection during the class. When teachers are not able to provide recordings of their classes the students suffer.

He also talked about the benefits of e-class, as he said digital classes can be much larger, and which will help reach more people. Another benefit which is intangible is that an e-learner can be self-paced. There is social benefit, as e-classroom makes it much easier for some students to speak up and communicate with the teacher using a chat box. Innovative pedagogy can be experimented with. He remarked " The quality of teaching and learning now indirectly depends on the quality of access to digital media". Online teaching also brings a challenge to teach a class in a homogeneous way. He continued by commenting that we really need to change higher education, especially because the pandemic has exposed the social and the structural fault lines which were there in India. He further added thatresearch is seriously affected as both applied and basic research require people to interact with one another and data collection in fields of social sciences and also work in laboratories in close proximity with colleagues in the field of sciences.These are important dimensions that we have to figure out how to do. He also suggested that this is the time when we have to boost research and not to curtail it, as without research we cannot protect our country from the long-term effects of the pandemic.

Prof. R. Nagarajhas recently retired from Indira Gandhi Institute for Development Research, Mumbai. He holds a Ph.D. in Economics from Jawaharlal Nehru University. His areas of research include aspects of India’s industrialisation, applied macroeconomics, public sector performance, the labour market in India, and official economic statistics.

He took the stage to share his views on Post COVID Economic Growth Challenges. He started with the introduction of how pandemic has brought change in the lives of people and how India has coped with the pandemic relatively well, with the number of positive cases and deaths reported being modest, relative to the population size. He discusses the disruption to production, hardships to workers and the population at large. Expectedly, there was a sharp contraction of output. In the April-June quarter of 2020, India lost nearly a quarter of its output, as per IMF estimates.

- By this time around last year, the economic slowdown was very evident from all available public information.
- The government was unwilling to admit it, though conservative economic policy and concern with inflation was dominant.

- Covid-19 pandemic and the economic lockdown were exogenous shocks, leading to a contraction of the output close to 8% of GDP, over the previous year, as per the official estimates.
- The government takes credit for minimal deaths due to the pandemic and quick output recovery. Both these claims are questionable: Our neighbouring countries seem to have similar health outcomes (due to similar social and health conditions).
- India's economic contraction is one of the worst among the world's major economies, baring perhaps Mexico and Argentina.
- Conservative economic policy has meant modest fiscal stimulus to augment aggregate demand. Most of the relief package was credit and liquidity support measures and structural reforms. These efforts, in principle, work from the supply side, whereas the real constraints on growth are from the demand side.
- The budget has sought to boost public infrastructure investment, investment in health and large- scale privatization, as a conscious effort to steer the economy towards the ruling dispensation's ideology: "Minimum government, maximum governance".
- However, there is very little for distressed migrant workers who lost their jobs and livelihood. Shockingly, the government seems highly insensitive to the plight of the poorest, blaming the pandemic as an act of God. It is painful to realize that a nation that supported ten million refugees from Bangladesh in 1971 for about a year, failed its own migrant workers now.
- Though impressive, the public investment proposals are under-funded in the budget, which is mostly dependent on privatization proceeds. Similarly, the seemingly impressive hike in the health outlay seems like a fudge of combining various related programs, with a modest increase in budgetary allocations for health per se.
- The response seems to fail to meet the challenge of gravest health and economic crises in post-independent India.

Technical Session II (2:30 PM-4:00 PM)

Theme: International Perspectives in Public health

The chairperson for this session was **Prof. Anuradha Chowdhary**. She is a professor of medical mycology in the Departmentof Medical Mycology, Vallabhbhai Patel Chest Institute, University of Delhi. Dr. Anuradha is currently working on molecular ecology of pathogenic fungi and epidemiology of systemic mycoses especially on Candida Auris, multidrug-resistant non-albicans Candida species, dermatophytosis, cryptococcosis, aspergillosis and histoplasmosis through various sponsored research projects.
Prof. Chowdhary spoke briefly on the theme of the session, introduced the three eminent speakers and invited them to share their views on **"International Perspectives in Public health."**

About Dr. Marc Choisy: He is a researcher from the Nuclear Department of Medicine, University Of Oxford, UK. He is a mathematician, interested in the modelling of the transmission dynamics of infectious diseases. He is currently a visiting scientist and holds a joint position

between the institutes OUCRU and IRD(French National Research Institute for Sustainable Development)

Dr. Marc took the lead in the second technical session.
He made a presentation on "Optimal Control Theory applied to COVID-19 social distancing interventions"

Key Points from the presentation.

- COVID-19 is a newly discovered virus so there was a huge gap of knowledge as many of the things are not known about this virus leading to dead-end treatments with almost a year passing by without a vaccine.
- Among the key things that we've learnt about this disease, the most striking one is that there's a large spectrum of severity and also unfortunately there's an asymptomatic transmission.
- So, we're also in the context where we have drugs to treat the disease and certain vaccines prepared against it.
- A quick recap of the situation of the last year :
    - more than 17 million confirmed corona cases and
    - more than 6 million deaths so far due to corona.
- The whole purpose of doing optimality is to weigh the costs and benefits of this pandemic and the costs and benefits have to be balanced. There are no dynamics at all in the level of intervention that can be performed.

Dr. Choisy concluded by stating that the optimal control theory is a very promising framework. It is a very under-used theory in epidemiology. There are some limitations to this approach too, that is the lack of data on the cost function.

About Dr. Olivier Telle: He is a Visiting Fellow at CPR, is an urban health geographer at Centre National de la Recherche Française (CNRS), UMR Géographie-cités (Paris-Sorbonne) with over 6 years of experience. He is currently associated with the Sci-Fi 2 project where he is leading the territorial dynamic axe in which he is developing research on disease geography in Delhi (Dengue, Chikungunya and Diarrheal diseases).

Mr. Telle presented his work on "The effect of mobility restrictions on the SARS CoV-2 diffusion: lessons from the first wave in Sweden, USA, France and Colombia".

Key Points from the presentation.

- It is really important to understand how disease spreads in the community, how mobility impacts the COVID spread.
- So far, the impact of mobility on disease spread was studied but now, the inverse link could be observed that is how covid impacts the mobility of people.
- In India, about 80% reduction of mobility in the first phase of lockdown was observed.
- Quantitative and qualitative shreds of evidence presented to justify the impact of mobility in different countries :

    - In France, there was the strongest impact on the mobility of people
    - In Colombia, it was the same as before.
    - In the USA there was a slight decrease, only 50-60% decrease in the mobility of people
    - In Sweden, there was quite a lot of mobility because Sweden did not choose to lockdown. At the end of August, people stopped moving due to the holidays but after the holidays it was the same, people got back to work.
- Cities are capturing high no. of mobilities resulting in high no. of increased coronavirus cases.

Dr. Telle concluded that mobility data improves the model (new cases per week per unit). Diffusion is not stopped due to the remaining mobilities in the metropolis. Metropolisation of the world is clear why some units could be considered as super spreaders, and they are always the centre of the network.

About Dr. Peter Patel: He is a microbiologist with 22 years of track record in the biomedical and health care sector, with significant senior-level teaching, management and leadership experience in academia and industry. Dr. Peter is the founder and International Director of the Faculty of Disaster Medicine – India & Nepal.

Mr. Patel presented his work on "COVID-19, Healthcare, Impact on Communities and Urban Resilience Building for Pandemics."

Key Points from the presentation.

- Many individuals and organisations have come up with solutions but, the western solutions did not work in developing countries.
- A pandemic occurs due to the introduction of a novel disease capable of infecting humans.
- On 30th Jan 2020, the Director-General of WHO declared the novel coronavirus outbreak a public health emergency but many countries didn't take this warning seriously. And on 2nd March, we have 64 countries affected and only 128 deaths. Later on 9th March 223 countries and over 116 million confirmed cases and number of deaths wasincreasing and a pandemic was declared on 11th of March. The countries were supposed to be prepared for this pandemic but they were not.
- During this pandemic, there were riots in Netherland for opposing lockdown, food shortages went out all around the world, lockdowns had a major impact on Migrant workers, healthcare staff were exhausted completely.
- The Health Care sector was highly impacted during this pandemic. It was difficult to treat patients adequately, bodies being dumped in unmarked graves with relatives not claiming the body because they thought they were going to be impacted, healthcare workers were affected, inadequate hospital infrastructure, limited drugs, PPEs equipment food etc.

- **Why are pandemics potentially damaging?**

The lockdown has its own major impact. Many business and manufacturing units completely collapsed including big brand names. Entertainment and hospitality industries were closed, Education got delayed, access to health care got delayed.

- **Impact on communities**
  Unemployment, poverty, mental health, delayed health care, domestic violence, alcohol and drug abuse, crime, hate attacks

- **Urban resilience building from pandemics**
  Urban resilience has been defined as "the measurable ability of any urban system, with its inhabitants to maintain continuity through all shocks and stresses, while positively adapting and transforming toward sustainability."
- Resilience and sustainability go hand in hand. A resilient city assesses, plans and acts. It prepares for and responds to all hazards(expected and unexpected).
- Understanding social and economic vulnerabilities is essential to formulate actions for resilience adapted to local needs.
- All the countries failed badly during the COVID-19 pandemic, not one country was prepared at any time. The majority of the countries' health security was weak and every country had a major gap to address.
- According to the Global health security 2020 report,there is little evidence that most countries have tested important health security and capacities would be functional in a crisis. More than half of countries face major political and security risks that could undermine national capability to counter biological threats.

Dr. Patel concluded by stating that cities can be made pandemic resilient but it’s a complex process. It should be part of the disaster medicine programme with full participation in global health security.Planning and decisions should be evidence-based and without political interference or biased. Healthcare professionals across the wide spectrum should be involved in all aspects.

Technical Session III (4:00 PM-5:30 PM)

Theme -**Public Health In India**

Chairpersons:

Prof. Raj Kumar (Director, VPCI) -Professor Raj Kumar is a renowned pulmonary physician, with nearly 3 decades of illustrious teaching experience to the students in the area of

DM/MD/DTCD (Pulmonary Medicine)/ Ph.D. He has contributed vastly to the research activities related to chest and allied diseases, with proven excellence in quality patient care. Professor Kumar has vast administrative experience too.

Dr. Anil Jain (Dean, Faculty of Medical Sciences, DU and Principal, UCMS, DU)- Dr. Jain is the Dean of the Faculty of Medical Sciences at the University of Delhi and Principal of UCMS, DU. He has attained his M.S. (Orthopaedics) in 1984 from Gandhi Medical College, Bhopal. He underwent Senior Registrar training from Central Institute of Orthopaedics, Safdarjung Hospital, and New Delhi. He subsequently joined as Lecturer in Orthopaedics in 1988 at University College of Medical Sciences, University of Delhi.

Chief Guest and Plenary Speaker

Prof. RandeepGuleria (Director, AIIMS, New Delhi)- Prof. Guleria is the Director of AIIMS, New Delhi. He is credited with the establishment of India's first centre for pulmonary medicine and sleep disorders at AIIMS.He was honoured by the Government of India in 2015 with the Padma Shri, the fourth highest Indian civilian award. He is an alumnus of St. Columba's School, Delhi.He is also part of India's COVID-19 response effort. Prof. Guleria is co-author of the book *Till We Win: India's Fight Against The COVID-19 pandemic*, with Chandrakant Lahariya, a leading Indian public policy and health system expert and Gagandeep Kang of Christian Medical College, Vellore.

Panelists

Prof. Daman Saluja (Director, ACBR, DU)-Prof. Daman Saluja, is currently a Professor at Medical Biotechnology Laboratory, Dr B R Ambedkar Center for Biomedical Research, University of Delhi, North Campus. She got her Doctoral degree in 1986 from the University of Delhi. Prof. Daman Saluja worked as a Research Scientist in various capacities (1987-1990) at the University of Delhi.

Prof. Suman Kundu (Director, Centre for Canadian Studies)-He is currently Professor of Biochemistry and Director, University of Delhi South Campus. He is also the Director of the Centre for Canadian Studies. Ph.D. from Banaras Hindu University, he was a post-doctorate in Iowa State University, USA and a Research Associate at Pioneer Hi-Bred, Dupont, USA. He was a Lecturer in School of Biotechnology, BHU as well. He has been honored with S.P. Tyagi Oration Award (2017) and Indo-US Research Fellowship (2010). He has published more than 75 research papers, 3 book chapters and 3 patents. He is the Founder Editor-in-Chief of Journal of Proteins and Proteomics (Springer Nature) and executive council member of Proteomics Society (India) and Protein Society (India). His research interests include structure-function-stability relationship in blood substitutes, diagnosis of hemoglobinopathies and drug discovery against cardiovascular and sickle cell diseases.

Highlights:

Professor Suman Kundu initiated the discussion on the importance of public health in the entire world. The whole world has seen a lot of suffering due to the ongoing pandemic. The responsibility of public health needs to be taken seriously in the entire world. Later the discussion was taken forward by the chairperson Dr. Anil Jain. He discussed the problems that India faced when COVID-19 started taking a peak in the country. He covered how the technology was used, how the tests were conducted and how they could cover a large population to do mass testing in the country.

Going forward Professor Raj Kumar explained how the educational institutes in India handled all the situations and came up with alternatives to provide education in times of pandemic. They also did a lot of research to come up with information related to the disease. Various researches were done to treat patients and the idea for setting up post-COVID management was considered.

Prof. RandeepGuleriadelivered the plenary speechon the theme. He began with the introduction of the disease and how countries like India saw an exponential rise and what were the steps taken to battle the pandemic. Various strategies were adopted by India like travel restrictions, lockdown, medical research, vaccine manufacturing, setting up of COVID-19 centres, mass testing, collaborating with various private labs and the validation of PPE kits by ICMR.

Key challenges- Professor Guleria spoke about some of the key challenges which included-

Protection of healthcare workers, the motivation of healthcare workers, and training on COVID-19 testing protocols, in spreading awareness about COVID-19, mentoring of the medical staff to function carefully.

Strategic responses- The government immediately started working on infrastructure, human resource planning to battle the disease. It formed various committees like the Resource management committee, IEC committee and many more. Huge amounts of donations were made in the PM CARE funds to support the nation and various researches were initiated to develop a vaccine. Tele- consultations were also provided to the customers that proved very helpful.

Vaccination- India truly proved best in producing the vaccine but also had various challenges for supply chain management. COVID-19 vaccine is the most trusted vaccine and many countries have taken the vaccine from our country. He mentioned that just manufacturing the vaccine is not the end of the disease, its availability has to be easy then only a controlled situation can be achieved. He spoke about the various stages of vaccine development which includes- pre-clinical phase and 3 other phases.

India preparedness and response- Vaccines can be a key area of thrust for controlling COVID-19. Proper awareness needs to be spread to convince people to get vaccinated and mythical dilemmas need to be removed from society about the vaccine. We really want to boost the production of the vaccine in order to complete the vaccination process early. Co-WIN apps

are developed by the government to track the number of vaccine recipients. Vaccination is first given to the frontline workers like doctors, public servants etc. The government is also taking the research forward to find out more about the new emerging UK and African strains. But later due to various biological mutations the new strain can pose a threat that the current vaccine might become less effective.

In terms of measures the pandemic is not yet over and wearing masks, sanitising frequently and maintaining social distancing is still a cornerstone of the pandemic reverse. Masks highly reduce airborne infections and thus contribute to reducing the number of cases.

Future of pandemics and the factors affecting: The predisposing conditions that led to the birth of the pandemic still exist. There is a gradual rise in the epidemics in the last century, due to human activities, rapid urbanisation with crowded living conditions and loss of animal habitats with increasing co- habitation.

Concept of one health- "Human health and animal health are interdependent". Hence we need to work on solutions at a local and global level to prevent future pandemic keeping in mind the following:-

- Interconnection of human and animal health
- Interconnection of human health and ecosystem
- Interconnection of animal health and ecosystem

Later **Prof. Daman Saluja** spoke about the various diagnostic methods that came up and how RT-PCR turned out to be the most effective. She emphasised making RT-PCR a self-testing method so that patients can test themselves and then go ahead for further treatment.

Technical Session IV (5:30 PM-6:30 PM)

Theme: Business, Health and Governance

Prof. V.K. Kaul chairperson for the fourth technical round is currently a professor at the Department of Finance and Business Economics, University of Delhi. He has held the position of Head, Department of Business Economics and Dean, Faculty of Applied Social Sciences and Humanities thrice. His current research interests include Geo-Politics, Geo-economics, economic transition and performance, India's diversity and globalization and public policy and business. He has about 64 research publications and 4 books to his credit.

He started the discussion by placing governance at the centre of focus which is going to be critical in taking care of the problem generated by this virus. The covid-19 virus has brought health issues at the top of governance which later turned out to be a business and economic crisis. The majority of human activities were disrupted because of the lockdown as it led to disruptions of business activities and the global supply chain except for a few essential services. New types of challenges emerged like the migration issues and people who were already vulnerable also suffered because of covid-19 problems.

How have people, organizations and government responded to this challenge effect when covid was at the initial level. A lot of discussions were there some people say they are in the fear zone, others are in learning zones and some in the growth zone. He further elaborated by saying that the same thing is happening everywhere even in the case of business also, we see that small and medium-sized enterprises face serious problems and threats to their survival, some are learning especially large enterprises. There were a lot of disruptions earlier already which further disrupted the activities of business and forced them to think in terms of transformation.

Some experts started declaring that it is the end of globalization but Prof. Kaul firmly believes there is no end to globalization and any attempt at stopping globalization will perhaps only change its form but won't put an end to it. The Indian government also learnt rapidly and it started moving on a growth path by announcing the AtmaNirbhar Bharat package whereas the west which is considered so developed is still facing the worst type of problems. Countries like India are taking a leadership position to declare that the vaccine's patent should be removed and India is also providing vaccines to a large number of developing countries.

Prof. Kaul invited Ms Shobha Mishra Ghosh to enlighten us with her views on the topic.

Shobha Mishra Ghosh is Director & Head, Government Affairs and Public Policy, India and South Asia, GE Healthcare. She has worked with FICCI for more than 10 years. She dealt with education, healthcare, policy interventions and development domains. She pursued her B. ARCH from Sir J.J college of architecture and further pursued PG Diploma in urban development from Institute of housing and development, Netherlands.

She began her talk of the Impact of the Covid-19 Pandemic on the Health Sectorwith a famous quote of Albert Camus, "There have been as many plagues as wars in history, yet always plagues and wars take people equally by surprise" and the Covid-19 pandemic was not different. Covid-19 has caused an unprecedented human and health crisis. It was an equalizer, it did not spare the developed world or the developing world, loss of human life and economic fallout was pretty distributed. The onslaught of a pandemic continues and we don't know for how long it will continue, but we can say that India has been slightly lucky as the virus spread was delayed and therefore, we could learn from the experiences, the mistakes and the lessons that the other country went through, and therefore we could form our strategies based on those learnings. Lockdown was the only way to save humanity and most of the countries went through

the process of lockdown, however, the severity of the lockdown was varied though it helped in the containment of the virus.On the contrary it gave the massive shock to social, economic and industrial activities. The Healthcare industry was the only industry that could not afford to halt. The global protocol became a way of life. Mask protocol, Travel protocol and hand hygiene and social distancing.

Impact on the Health Services Sector

Indian healthcare delivery is hugely dependent on private healthcare, the majority of Indians continue to depend on private healthcare facilities. In rural areas, 52 percent of people went to private hospitals and in urban areas, 65 percent of people opted for private hospitals. The private sector contributes more to the healthcare infrastructure if we talk in terms of hospitals, hospital beds and ICU beds.

Impact of COVID-19 on Private Healthcare Providers

- Many hospitals had to downsize staff to 20-30%
- Hospitals performing more COVID work needed to maintain a higher staff requirement to reduce continuous exposure to infected rooms and adhere to quarantining norms.
- Requirements like ventilators or augmenting infrastructure for Covid preparedness has been incurred over the past year.

The private sector partnered with the government and offered their facilities, manpower and equipment for Covid treatment. India has significantly ramped up Covid-19 testing from a "one lab, one test" scenario in January to 8 lakh tests a day through more than 2400 labs today.

Impact on Pharma and MedTech Sector

- The sector is expected to have a CAGR of ~12% in this decade to reach US $130 Bn by 2030
- FDI inflow from April 2000 to September 2020 has been USD 16.8 Bn.
- The Indian pharmaceutical sector is expecting the sales to normalize by the second half of 2021, with the availability of Vaccine, Covid-19 receding, and Hospitals and Physician clinics functioning.
- The MedTech Industry in India is import-dependent. 86% of our medical devices are imported from various countries like the USA, Germany, Japan, China etc.
- After FDI was brought on the automated route there was a sharp increase in FDI. But the trajectory fell after capping of stent and Knee implants.

Impact of COVID-19 on Pharmaceutical and MedTech Industry

- Disruption in manufacturing capacity and restricted movement of workers and goods.
- Exports and Imports halted.
- Lack of data and information.
- Approvals for Drugs as no Treatment insight

- No Demand Generation from hospitals.
- Registration and license granting process disrupted.

Factors that hindered the fight against COVID-19 include:

- No manufacturing of Active Pharmaceutical Ingredients (API) in-country, high imports from China and supply were disrupted with borders sealed.
- No manufacturing of Diagnostic Kits.
- No or minimal local manufacturing of essential commodities such as N95 Masks, PPEs and Ventilators.
- Challenges in Approvals, Clinical Trials and Research and Development.

Strategy and Planning involved the coming together of the three pillars - Government, Industry and Industry Associations. The Success Mantra of - Cooperating & Competing + Transparency + Mutual Trust has been very effective and shows results during such tough times.

The government acted swiftly and made several arrangements to respond to the COVID crisis in the following ways -

- Digital meetings, Knowledge sharing and forging collaborations, Telemedicine Guidelines.
- Launch of the National Digital Health Mission and AtmaNirbhar Bharat.
- Local manufacturing capacity was enhanced in terms of Diagnostic kits, Ventilators, PPEs and Sanitizer.
- Special Economic Package of INR 20 Lakh Crore for all sectors- Equivalent to 10% of India's GDP announced.
- INR14586 Cr allocated to Pharma and MedTech Industry over the next 6 years for infrastructure development in Budget 2021.
- Production Linked Incentive (PLI 2.0) was announced in March 2021. In PLI 1.0 and 2.0, the government has identified those drugs and devices that are being imported and not being manufactured and now India will be manufacturing everything domestically.

Made in India COVID-19 Vaccine has been presented to the entire world through the vaccine Maitri initiative. India has delivered millions of doses of Made in India vaccine to various countries including Canada, Europe, Latin America, Southeast Asia, the Pacific Islands and Africa.

Ms Shobha ended the discussion by quoting- “1.3 billion Indians have embarked on one mission to make India self-reliant. 'Atma Nirbhar Bharat' merges the local with the global. It ensures India's strengths act as a global force multiple."

Technical Session V (7:00 PM-8:15 PM)

Theme: Literary Perspectives: COVID Time Poetry

The chairperson, Prof. Malashri Lal, retired from the Department of English, University of Delhi in the year 2017, she has held many senior administrative positions-- Joint Director of the South Campus, Head of the Dept. of English, and as the Director of the Women's Studies & Development Centre, University of Delhi. Among her 13 published books, these are the latest works, the co-edited volumes, *Speaking for Myself: Anthology of Asian Women's Writing, In Search of Sita: Revisiting Mythology*. She has filled in as a jury member for a few artistic award honours including the Commonwealth Writers Prize, London and is presently an individual from the Steering Committee for the DSC Prize for South Asian Literature. Her area of specialization includes Women's Studies, Cultural Studies, and Indian Literature in English.

Speakers:-

Dr. Chandra Mohan— He is a retired Faculty from the University of Delhi. He is presently the General Secretary of the Comparative Literature Association of India. He is Chair, ICLA, Standing Research Committee, South Asian Literary Works and Societies.

Dr. Cyril Dabydeen-- He is a Canadian author of Indian origin (born in Guyana). His most recent 20 books incorporate *My Undiscovered Country, God's Spider, My Multi-Ethnic Friends, and Imaginary Origins: New and Selected Poems*. His epic, *Drums of My Flesh*, is a Guyana Prize winner and received a nomination for the IMPAC Dublin Prize.

Dr. Blaine Marchand—His honour-winning prose and poetry have been published in magazines across Canada, the US, New Zealand and Pakistan. He has 6 books of verse, a young adult novel and a work of non-fiction published. He was on the National Council of the League of Canadian Poets for various years and was its President from 1991-93.

Dr. Laxmi Gill — Lakshmi Gill, born in Manila (Punjabi/Spanish-Filipina), went to Western Washington University (B.A.), University of British Columbia (M.A.), Mt. Allison University (B.Ed.), University of New Brunswick, Fredericton (PhD examines), and lectured in Canada, Hong Kong, and England. Her work incorporates *Returning the Empties: New and Selected Poems: 1960s to 1990s, The Third Infinitive* (a novel)*, Novena to St. Jude Thaddeus*, and she has published compilations in North America and India, and literary magazines in several countries.

Dr Rita Malhotra — She is a Retired Principal, Kamla Nehru College, DU and has a postdoctoral from University of Paris. She is a mathematician, writer, poet and interpreter. The recipient of several worldwide acknowledgements, including the honour of the world congress of writers 2019, she is presently the President Poetry across societies India.

Dr. Anamika-- Associate Professor, Department of English Satyawati College. She is a Hindi poet, author and interpreter. Sonnets from her public honour winning verse assortments '*khurduri', 'doob-daan'* and '*tokrimeindigant'* are endorsed at public colleges like JNU, SNDT Mumbai, Kochi University and furthermore the University of Moscow.

Dr. Sanjukta Dasgupta — Convenor of English Advisory Board, Sahitya Akademi, New Delhi and President of Executive Committee, Intercultural Poetry and Performance Library at ICCR, Kolkata and Visiting Professor of Jagiellonian University, Krakow, Poland (2018) and Professor, Dept of English (Retd.) and furthermore Former Dean, Faculty of Arts, Calcutta University, Kolkata.

Highlights:

Chairperson Prof. Malashri Lal opened the session with an introductory note. She spoke about similarities in literary cultures of India and Canada and that both are linked to England by their political histories. Writers from both countries are perplexed by their respective identities and seek identity markers through literature. Space is a relative concept within which identities are created. Covid has actually limited the boundaries of national space while opening up the boundaries of digital space. Speaking and writing nowadays has to be adapted to include all cultures. Writers are the voice of the nation. She then quoted Marshall McLuhan's phrase "the medium is the message" to drive home her point.

Dr. Chandra Mohan then explained that hardly any one of us could have imagined a pandemic hitting us so hard and our whole lives changed. It is as if there is a gruesome spectacle going on all over the world. It has also offered opportunities for creativity. When we read a good poem, we change. We are transformed by poems where poets express emotions or feelings. Poetry offers insights into the human psyche and behaviour. Through poetry, we can better understand the hardships through which people are going through. He then read out some of the poems he has written over the years which can describe the current situation we find ourselves in.

Dr. Rita Malhotra then added to the discussion with her wonderful insight. She said poetry has immense transformative power. During the pandemic when people were free from the toils of normal lives, unharnessed poetic spirit started pouring in from all over. People were actually living in unprecedented times. In the struggle to keep themselves whole, people were looking for space for solace. Poetry gave them that meditative space.

Dr. Sanjukta Dasgupta through her poems 'Cracking the Lockdown' and 'Hired and Fired' talks about downsizing and job losses that plagued a huge part of the population in all countries during the pandemic. The sense of empathy, doom and fear that people were feeling is expressed vividly in these poems.

Dr. Anamika, through her poems 'Healing Power' and 'Oh Boishakh', captures not only the tragic moments of the pandemic but also talks about the possibility of hope and a new dawn on the horizon.

The Canadian poets **Dr. Blaine Marchand**, **Dr. Cyril Dabydeen and Dr. Laxmi Gill** joined the session online but in order to avoid technical problems, recordings of their poems were played during the session.

Dr. Blaine Marchand mentioned that South East Asia held a part of his heart since he was posted to Islamabad as a diplomat from 2008-2010 and had visited the countries in this region during his project work with the Canadian International Development Agency from 2002 to 2011.

His first poem is based on vivid dreams, an occurrence that many seem to have experienced during the pandemic. He stated that he has always been a lucid dreamer and over the decades some of his poems have been based on the dreams he has had. “But perhaps in this COVID period, my dreams are more surreal. But they remain set in nature, which is a constant theme in my writing.” Some excerpts from his poems:

Viral Dream Sequence

1. Pristine white,
smooth as ice,
the bed is a block,
is a slab
in the verge of the forest.
At its head and foot
the sheet is wedged,
tucked tight,
weighted down
by the mattress,
by me sleeping rough.

2. An infection of crows
outbreaks from the trees,
bunches in mass,
wings rounded,
tails squared,
swarm overhead,
a threatening cloud.
Their voices, ragged
and bridled,
rend the air –
a clap of thunder,
sudden deluge.

3. An updraft of bees
streams from a tree hollow,
water drops condensing,
rotating, a funnel
of wings rumble and roar
through the air
incontinuous loop,
build to crescendo,
settle on a nearby branch.
Sudden silence,
dead calm.

4. I am splayed
across the sheet,
utterly still
among debris –
dark disorder of feathers,
clusters of bee shells,
which I gather
with my fingers,
cast off. They tumble
through the air, realign,
a scrawled prognosis
across my body, the bed.

The second poem he read came about because each afternoon, he would walk for two and a-half hours. “Where I live in Ottawa is close to the Ottawa River, which covers 1,271 km (790 mi), running from Northern Ontario to Montreal where it empties in the St. Lawrence River. The river is a boundary between two provinces, Ontario and Quebec.”

“Walking by myself is a way to deal with the lockdown and isolation required by our city. I find it also triggers my creativity and inspires poems I work on the next morning. It is winter here in Canada and so it is still cold and snow blankets the ground. Along the shores of the river are walking trails that in winter are groomed so they can be used by skiers, walkers and people who love winter bicycling. Three days a week, I walk along these trails. Also, there are groomed trails among the small woods found close to the river path. I have been walking through these woods, which are magical after a snow storm. I find then endlessly fascinating to stroll through as they are a respite from the overload of pandemic media coverage and the hustle and bustle of the city.” The third poem he read was Kitchissippi Woods. Kitchissippi is the original indigenous Algonquin name for the river – Great River. This poem came about because he misremembered a line from the famous poem, Sailing to Byzantium, by William Butler Yeats, a poet who influenced him when he was younger and apparently still does. This poem echoes and yet diverges from Yeats’ point of view of life and art.

Dr. Cyril Dabydeen read four poems. He highlighted that two of his poems had reference to birds like crows and animals like goats because all creatures respond differently to COVID. The poem “A Life of Crows,’ was set in Ottawa, while the poem “A Goat in the Yard,” had a subtle religious theme about the sacrificial lamb using paradoxical imagery. The poem entitled, “Last Inhabitant on Earth” suggested the apocalypse. The final poem he presented was called, “ Heart and Lungs.”

Dr. Laxmi Gill read the following two poems: Cortical Geography and Virtual Touch.

CORTICAL GEOGRAPHY

The place takes you, takes you in
the stream of memories, in the childbirth,
in the bone, in the sinews, in the skin.

The white care home sheet covers you
mother womb layered in dark blood
storage of fragments and word shards.

The dead awaken with confabulation
distorted engrams dismembered in retrieval
recomposed in altered consciousness.

As devastation sweeps across the mindscape
your being reveals itself in absence
trace fossils in enduring sediment.

VIRTUAL TOUCH

Virtual touch is the early morning dew fainting
onto violet petals that float on a watery world
where the foam on its waves vanishes into fog
and there it burns. It burns off like an étude
stripping air off lungs while it lingers as droplets
filling time and space. Gasping, I hold out my hand
which once you clasped into yours and now to nothing.
Morning faints into a day of fierce sunlight
burning eyes reflecting an empty stage, the poet's
voice gone silent like dead lilies beside an urn.
The theatre divides as you walk away into shade
and perhaps you turn as you hear a faint thud
in the wings. But beginning begins a thousand hours
again. This morning burns dew-kissed red orchids
shattering, scattering in the wind as I, fading,
draw the curtain on the sun.

All the Canadian poets talked about their personal experiences of dealing with this unprecedented situation arising from the COVID 19 pandemic in their country via excerpts from their acclaimed poems.

In her closing note, Prof. Malashri Lal spoke about how wonderful it was to see people from Canada and India speaking through poetry and that a shared sense of isolation has actually brought all of us together. This situation has redefined the meaning of home and relationships in our lives. She also says poetry is the voice of the people. In these trying times, fortitude, faith and hope are what kept people going. Now, finally, there is indeed hope with many of us having received the vaccine. The dawn we have been waiting for has finally arrived and hopefully it will

extend till day. Lastly, she dedicated the evening to the burgeoning friendship between Canada and India through literature.

DAY 2

Technical Session VI (3:15 PM-4:45 PM)

Theme: Environmental Impact And Policy Issues.

Chairperson:

Prof. M. N. Murty has retired from the Institute of Economic Growth, Delhi. He is currently an Adjunct Professor at the Amrita Center for Economics & Governance (ACEG), Amrita Vishwa Vidyapeetham. He was a Ford Foundation Fellow at the University of Birmingham, and a Research Fellow at London School of Economics, UK, Visiting Faculty, at Institute of Developing Economies, Tokyo, Japan, and Visiting Professor at National Institute of Public Finance and Policy, and TERI University, Delhi. He has also worked as a consultant for World Bank, Asian Development Bank, International Crop Research Institute (ICRISAT) and ESCAP.

Speakers:

Prof. Maharaj K. Pandit - a Professor at the Department of Environmental Studies, & Director, CISMHE, University of Delhi. Formerly, the Nee Ann Kongsi Distinguished Visiting Professor at NUS, Singapore and Radcliffe Fellow, Harvard University, his research focuses on Himalayan ecology, biodiversity conservation, macroecological patterns, biotic extinctions driven by land use changes, science policy and conservation diplomacy. He was former Dean, Faculty of Science, University of Delhi. He is currently the CEO of IoE, University of Delhi.

Prof. Purnamita Dasgupta - She is the Chair Professor & Head of the Environmental Economics Unit at the Institute of Economic Growth, Delhi. She is an author/advisor to international research assessments such as the Intergovernmental Panel on Climate Change, International Panel on Social Progress and the Himalayan Mountain Assessment. Currently she is on leave from IEG and is at ICIMOD as “Theme Leader—Ecosystem Services.”She has been visiting professor at University of Cambridge, UK and Johns Hopkins University, USA. She has contributed to modelling for India’s NDCs and NATCOM processes for the UNFCCC, been a member of several national committees such as drafted regulation on e-waste, Natural resource accounting committee for the CAG’s office, Supreme Court committee on estimating NPV for Forests, and the committee to evolve environmental standards for India, among others.

Prof. Meeta K. Mehra - She is a Professor of economics at the Centre for International Trade and Development, JNU. She has a Ph.D. in Economics, Economics and Planning Unit from the Indian Statistical Institute (ISI). She is a member of the Board of Studies (BoS) of SIS and a Lifetime Member at the Indian Society for Ecological Economics (INSEE).She is also a member of both the Agricultural and Applied Economics Association and the European Association for Environmental and Resource Economics. Her key Areas of Specialization/ Research Interest-- Macroeconomics, International Macroeconomics, Growth Theory, International Trade, Development, Political Economy, Electoral Competition, Economic Regulation, Climate Change Economics, Environmental Economics, Energy and Resource Economics, Economic Modeling. Prof. Mehra is an expert reviewer for IPCC

Highlights of the session:

Under the ingenious moderation and poised leadership of Chairperson **Dr. M. N. Murty**, the final technical session began with successive presentations by the three speakers, the diverse contents of which were elegantly weaved together by the Chairperson himself.

The first speaker, **Prof. Maharaj K. Pandit** spoke about the origins of COVID, the history of mankind and the evolution of Anthropocene to Coronocene. “Though there has been a lot of controversy about the origin of COVID, it is very evident that it originated through the human contact with certain animal species, living or dead”, quoted Prof. Pandit in correlation to the outbreak. He discussed the 3 crucial stages of human evolution:

1. Bipedalism: humans would walk long distances without wasting much energy.

2. Before fire, humans ate raw meat hence had larger jaws and smaller brains with an average lifespan of 27-28 years. The discovery of fire got them heat and cooked meat leading to reduction in jaw size that helped in the development of the human brain.

3. The machinery revolution/industrial revolution, and revolution of the world with liquid fuel and electricity.

Anthropocene: “Human have dominated so much of the earth, it had almost now shifted from geological phase to anthropological phase.”

The World War – II had deeply impacted the environment and economy. “The period between 1945 to 2000+ is called ‘The Great Acceleration’.” Prof. Pandit mentioned that after the 1950s, the skyrocketing of consumption brought about undesirable consequences in the form of pollution, population shoot, etc.

The economic developments had many negative offshoots. But despite the economic and technological prowess of humans, the COVID-19 brought about a halt in the entire system which Prof. Pandit calls Anthropause. With this differentiated era of COVID-19, people rejoiced a global reckoning and environmental correction, thus allowing researchers to quantify the

effects of human activity on wildlife. But even though this pause brought about positive changes for the environment, the economy suffered greatly and hence, evolution from Anthropocene to Coronocene which is going to stay for a while now and create dramatic sociological impacts. He believes that investments to prevent tropical deforestation and to limit wildlife trade will protect against future zoonosis outbreaks.

“Urban environmental sustainability is not just about the urban area”, said **Prof. Purnamita Dasgupta**, the second speaker of this technical session where she focused on her research area which documented the Hindu-Kush Himalaya region, and how changes in the weather and climate pattern impacted one-fourth of humanity, especially us Indians. Prof. Purnamita mentioned the following points:

1. Biodiversity connection of COVID-19: Deforestation is leading to more infectious diseases in humans. 2. Ecology and economics for pandemic prevention: The actions we outline today will help prevent future pandemics before we start

3. The economy has taken a hit, the different public sectors have taken a hit. And we need a certain kind of investment to build-back the system.

4. The long-term problem of haze filled Indo-Gangetic plains was a major positive point in the rather gloomy COVID scenario. This was a good story but in a very unfortunate process.

Prof. Purnamita suggested that we needed to understand the COVID 19 disruption from an economic perspective and try to rethink our stance on many measures such as:

1. Debilitating economic relief and recovery.

2. Bringing about public investment in healthcare.

3. Restoring jobs, employment and purchasing power.

4. Supporting local producers and upliftment of MSMEs.

5. Developing extensive digital infrastructure.

6. Tending more towards becoming gender sensitive and promoting inclusive rehabilitation.

She said that COVID-19 and the crisis management measures brought into limelight the complex interlinkages between the natural environment and human well-being be it the intricate GDP and nature relationship, the measurement of the tangible and intangible values and their economic and social impacts. She also suggested that we can make sustainable development through 4 approaches:

1. Blended Approach

2. Interdisciplinary Approach

3. Integrated Approach, and

4. Transboundary Approach

“In a weird way, COVID has taught us the lesson that we are so interconnected with nature that we have to respect nature.”

The third speaker, Prof. Meeta K. Mehra mentioned the socio-economic impacts and vulnerabilities of COVID-19 and the imperative for Green recovery. She said that “COVID-19 is not merely a public health predicament, but has manifested in the form of an economic and social emergency”. Prof. Mehra compared the various nuances of the pandemic and the respective course of containment measures taken by India and Canada. She progressed that hardships have provided opportunities to envision fundamental changes in adopting greener and more sustainable growth trajectories into the future.

Prof. Mehra measured the various economic and socio-economic impacts of COVID-19 on both the countries and singled out comparisons based on individual economic factors and dependent variables. She further went on to mention the various opportunities for green recovery through sectoral measures and cross-cutting options such as:

1. Sustainable Infrastructure.

2. Efficient and cleaner energy sector.

3. Climate smart agriculture.

4. Green Manufacturing

5. Biodiversity and ecosystems based approaches for planetary health.

She mentioned these measures banking on 5 factors:

1. Regulatory measures.

2. Creating markets – getting prices right

3. Green fiscal incentives and support

4. Greening support from the banking and financial systems.

5. International policies.

Prof. Mehra emphasized on efficacious implementation of green economic recovery plans and policy measures with an emphasis on accelerated actions towards medium and long term environmental goals, both natural and global ones. She suggested putting people at the centre

of green recovery plans in the post-COVID phases on international frontiers and through cooperation across regions.

Valedictory Session (5:00 PM)

Theme: The Way Forward

Chairperson

Prof. PC Joshi is a Professor of Social Anthropology in the Department of Anthropology, University of Delhi. He holds a B.Sc. degree in Anthropology (1975), an M.Sc. degree in Social Anthropology (1977), M.Phil. degree in Social Anthropology (1979) and a Ph.D. degree in Medical Anthropology (1985), all from the University of Delhi. Prof. Joshi was was appointed the 23rd Pro Vice Chancellor of University of Delhi. He is currently the Acting Vice Chancellor of DU. Prof Joshi has co-authored 9 books, more than 157 articles, book chapters and reviews on Medical Anthropology, Traditional Medicines, Shamanism, Impact of Disasters, Life Style Diseases and Antibiotic Resistance. He has dealt with many research projects and submitted more than 14 examination reports to different financing agencies and government strategy planning offices.

Chief Guest and Plenary Speaker

Professor Mahesh Verma-- Prof. Mahesh Verma is an Indian prosthodontist and the Director and Principal of Maulana Azad Institute of Dental Sciences. He is the Vice-Chancellor of Guru Gobind Singh Indraprastha University. The Government of India honoured him with the Padma Shri in 2014, the fourth most elevated civilian award, for his commitments to the fields of medicine.His academic contribution has been recognised globally. He is a fellow of the Royal College of Surgeons & Physicians, Glasgow; fellow, Royal College of Surgeons, England; fellow, Royal College of Surgeons, Edinburgh; fellow, International College of Oral Implantologist and an honorary member of the American Dental Association, etc.
A WHO fellow, Prof. Verma teaches healthcare management at the FMS, Delhi University. He is involved in WHO social and community projects as well as institutional projects of the Council of Scientific and Industrial Research (CSIR), Indian Council of Medical Research (ICMR). One of his projects is the development of indigenous dental implants involving Indian Institute of Technology and the CSIR, funded by the Ministry of Science and Technology.

Highlights:

After the presentation of the major highlights of all the 'Technical Sessions,' Prof. PC Joshi began addressing the audience. He started with the talk on how COVID has been affecting the nations and that India has been in a better place right from the beginning. India has shown its resilience unlike other countries. Even universities played a commendable role in fighting the virus by contributing to research. In terms ofenvironmental impact, he pointed out that we have seen many surprises. Like the river waters for example in Yamuna were becoming clean. There has been a change in biodiversity and many new birds and animals have come out in the open. While closing his address Prof. Joshi mentioned that the COVID 19 scare may be over but then the lessons that have been taught to us will stay forever.

After Prof. PC Joshi addressed the audience, Prof. Mahesh Verma was introduced and called upon by Prof. Yamini Gupt to deliver the Valedictory Address.

The plenary speaker, Prof. Mahesh Verma began his talk by acquainting the students with his experience of being involved in COVID care as appointed by the Delhi Government. COVID has been considered as the big elephant of the room and has caused socio economic crisis all over the world, bringing the world to a complete stand still. What popped out of this is collaboration on various fronts by the people and organizations. Especially in the case of Urban Sustainability, collaboration takes the centre stage, right from space, transport and ICT alongside the critical health system. Our Indian ethos has been showcased during this hard time. Quoting Vasudev Kutambakam and the quote by Swami Vivekananda calling the people "… brothers and sisters..," tells that we have always been concerned about the people around the world and not just the Indian citizens. India has been sharing vaccines and test kits and PPE with several countries and helping in every which way during this tough time. Coming on to the topic of Urban Sustainability, Prof. Verma stressed on the fact that it is the need of the hour to have sustainable cities which meet the needs of the present without sacrificing the future potential. Limited resources makes it even tougher to sustain the local towns and cities until and unless the resources are used judiciously. One cannot be just bothered about self and local areas but needs to be worried about the entire world as a whole.

Pandemic has brought to the fore many issues and recirculated many interests. Environment boomed again which was infested with worries about things such as climate change, global warming etc. All of it happened as the human beings encroached into the natural habitat of animals. Pandemic has come up as an opportunity for learning from these unprecedented times and making our surrounding and cities resilient to such shocks. This has also underlined the need for more SMART cities in India to fight such tough times.

COVID is being called as a VUCA incident – Volatile, Uncertain, Complex and Ambiguous. But taking a different approach, and by reversing it to ACUV – Attitude change, Collaboration, Universal human values and Victorious, can change the way we tackle this issue worldwide. It has been a herculean task utilising the existing infrastructure and manpower to dealing with pandemic with the available resources given that we had not experienced such a situation and with no research or solution in sight.

Some of the lessons that COVID19 taught us are:

1. Infectious diseases infrastructure to be readied on a big scale such as while dealing with disaster management.
2. More focus on the Health Sector in terms of budget expenditure is required.
3. Increase in health care personnel and associated manpower.
4. Infrastructure and lab modernisation needs to be stressed upon.
5. Education and awareness needs to be circulated busting the myths around such issues.
6. Taking care of vulnerable segments of population during these tough times.

Towards the end, Prof. Verma reiterated that there is a need for critical reflection on the importance of cities and how they are governed. There is a room for improvement in both India and Canada so that sustainability and human connection can be furthered more. He also applauded the efforts of Centre For Canadian Studies for organising such an event which will help provide more food for thought.