CSIR-NISTADS Collective Intelligence Policy Session

In Collaboration with Vijnana Bharti (VIBHA)

On

Traditional Knowledge Systems for Risk Preparedness and Disaster Mitigation in Future Pandemics

Chief Guest

Dr. Shekhar C. Mande

DG, CSIR and Secretary, DSIR, Government of India

Distinguished Panelist

Dr. Manoj Nesari
Advisor, Ministry of AYUSH

Prof. Ramakrishna V. Hosur
TIFR, Mumbai

Prof. Rama Jayasundar
Head, Department of NMR, AIIMS, New Delhi

Dr. Anil Koul
Former Director, CSIR-IMTECH
Vice-President, Johnson & Johnson

Prof. Rupesh Chaturvedi (Moderator)
Professor, SBT, JNU

Patrons

Prof. Ranjana Aggarwal
Director, CSIR-NISTADS

Shri Jayant Sahasrabudhe
National Organizing Secretary, VIBHA

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Dr. Sujit Bhattacharya
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Coordinators

Dr. Suman Ray
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August 28, 2020

Highlights of the Policy Discussion

Traditional Knowledge Systems for Risk Preparedness and Disaster Mitigation in Future Pandemics

CSIR-NISTADS' Collective Intelligence Policy Series

In Collaboration with Vijnana Bharati (VIBHA)

August 28, 2020

Third Collective Intelligence Policy Session of CSIR-NISTADS in Collaboration with Vijnana Bharti (Vibha) on "Traditional knowledge systems for risk preparedness and disaster mitigation in future pandemics" was successfully held on August 28, 2020 on MSTeams platform. There was active participation with presentations made by eminent experts that was followed by an intense question-answer session. The important issues that emerged from each presentation was disseminated through NISTADS twitter handle. The program and summary of this policy session is enclosed below.

Program	
Introduction & Welcome Address **4.30 PM - 4.35 PM**	**Prof. Ranjana Aggarwal** Director, CSIR-NISTADS
Introduction of Dr. Shekhar C. Mande **4.35 PM – 4.40 PM**	**Prof. Sujit Bhattacharya** Chief Scientist, CSIR-NISTADS
Inaugural address **4.40 PM- 4.50 PM**	**Dr. Shekhar C. Mande** Director General, CSIR and Secretary, DSIR, Govt. of India
Introduction of panelists **4.50 PM – 5.00 PM**	**Dr. Suman Ray** Senior Scientist, CSIR-NISTADS
SESSION I **Panelists Opening Remarks** **5.00 PM - 5.40 PM** **5-7 Minutes Each Panelist**	**Dr. Manoj Nesari** Advisor, Ministry of AYUSH
	Prof. Ramakrishna V. Hosur Professor, TIFR, Mumbai
	Prof. Rama Jayasundar Head, Department of NMR, AIIMS, New Delhi
	Shri Jayant Sahasrabudhe National Organizing Secretary, VIBHA
Collective intelligence policy interactive discussion **5:40 PM – 5:50 PM**	Moderated by **Prof. Rupesh Chaturvedi** Professor, SBT, JNU
SESSION II **SAMVIGYAN** **5:50 PM - 6:10 PM**	**Dr. Anil Koul** Former Director, CSIR-IMTECH Vice-President, Johnson & Johnson
Concluding Remarks (including Q & A session) **6:10 PM - 6:25 PM**	**Prof. Rupesh Chaturvedi** Professor, SBT, JNU
Vote of Thanks	**Dr. Madhulika Bhati** Principal Scientist, CSIR-NISTADS

The Summary of this Collective Intelligence Policy Session.

Welcome Address: Prof. Ranjana Aggarwal (Director NISTADS)

Prof. Aggarwal welcomed Chief Guest Dr. Shekhar C Mande (DG, CSIR and Secretory, DSIR Government of India) by expressing thanks for his support and taking time from his busy time schedule to address this policy session. She expressed her thanks to the experts for their support and encouragement and organizing committee Chairman and Coordinators and technical team for excellent coordination. She welcomed all the participants.

Introduction: Prof. Ranjana Aggarwal (Director NISTADS)

In her opening remarks Dr. Aggarwal discussed the importance of Indian Traditional Medicine System for maintain health and well-being. Talking about current pandemic created by COVID-19 (Corona Virus Disease- 19), she highlighted havoc created by this pandemic to mankind worldwide stressing the fact that previous virus outbreaks were limited to certain geographic locations. She also said that because of confinement of previous outbreaks to limited geographical locations, we could mitigate them. SARS-Cov-2 (Severe Acute Respiratory Syndrome- Corona Virus-2) is an unpredicted virus. Talking about morbidity and mortality of COVID-19 she said as of now more than 24,000,000 people have been infected with COVID-19 and more than 8,000,00 people have lost their lives worldwide. She emphasized that due to timely implementation of lockdown and other righteous interventions India has been able to create proper mechanisms to control this health crisis. Currently morbidity due to COVID-19 is 1.82% of the total cases in India as compared to global average of 3.39%. She said that the lower level of morbidity of Indian population effected by this pandemic may be due to huge demographic dividend (a large young population), and hot temperature. Another important factor would be the healthy life styles and traditional medicinal practices of Indian population in general that helps strengthen immune system and thus gives a better ability to fight this disease.

Use of Ayurveda medicines such as ginger, turmeric, Clove, garlic, tulsi, alovera etc. in our daily life boost the immune system of Indians. Indians also change their food with seasons, this helps in making harmony with the nature. India is gifted with rich traditional knowledge of Ayurveda and wide diversity of plants available for preparing Ayurveda medication. Use of Ayurveda gives us a unique national (Swadeshi) perspective. Indians believe in “Vasudhaiva Kutumbakam (Meaning the entire world is one family” that leads to inclusion perspective. Further harnessing of full potential of Ayurveda and reaping its benefits, proper documentation and integration of Ayurveda with modern medicine requires to be done. Integration of traditional knowledge with modern medicine is required because these works on separate principals. Modern medicine is based on single compound lacking holistic approach while Traditional system of medicine is generalized system rather than personalized system conferring holistic health.

Welcome and Introduction of Chief Guest Dr. Shekhar C Mande, Director General, CSIR Secretory, DSIR, Govt of India by Dr. Sujit Bhattacharya (Chief Scientist, NISTADS)

Inaugural Address: Dr. Shekhar C Mande

Dr. Mande congratulated NISTADS for organizing this important Collective Intelligence Policy Session. He felt that today's session will be very helpful and give new directions. He highlighted some salient aspects that provides insights to the understanding of traditional knowledge and its impact. He underscored that pandemics also happened in India in 16th, 17th and 18th centuries. He said proper strategies were there at that time to combat these pandemics. He mentioned that Traditional Medicine System has been used for combating various pandemics such as Cholera, Plague, Small Pox etc. since time immemorial. The first Cholera pandemic emerged in India in 1817 out of the Ganges delta. John from East India Company mentioned in 1757 that tika (Vaccine) practice existed in Bengal, before actual discovery of world's first vaccine i.e. small pox vaccine introduced by Edward Jenner in 1796. John had mentioned that learned people from Banaras travelled to many places one month in advance before onset of monsoon with some inoculum. These people inoculated people and specified many dietary restrictions to people who have been inoculated. Those people were not allowed to eat fish, ghee, oils during inoculation period. This tika was recognized by Royal Society of Bengal. He concluded by saying that we are proud for traditional knowledge we have from ancient time in our country. Modern medicine has evolved recently just 90-100 years back. He said first randomized controlled trial of streptomycin was done in 1948. Traditional knowledge have been documented in Egypt, China, Greece, India etc. in ancient times.

After introduction of the panelist by Dr Suman Ray, each of the Panelist delivered their talk focusing on key aspects on the topic. The highlights of the presentations made are are mentioned below:

Integration of Ayurveda and allopathic medicine is needed

Dr Manoj Nesari (Advisor, Ministry of AYUSH) in his opening remarks emphasized that it is not integration of Ayurveda and allopathic medicine rather it is integration of traditional knowledge with other branches of science. In last 50 years or so Botany is getting integrated to Ayurveda. Use of Ayurveda leads to both the promotion of health and f environment as what goes on inside the body should be in harmony with what goes in outside environment. Ayurveda believes in 5 basic elements (Pancamahabhutas: earth, water, fire, air and space) manifest in the human body as tridosas (Vata, Pitta and Kapha). In Charak Samhita it is mentioned that these 5 elements should be in balanced state with the universe. If one of these is elevated it would have adverse effects e.g. if Vata is elevated in the universe it would lead to Tsunami, Earthquake like calamities. He said there should be holistic and cumulative combination of different kind of systems within and outside the body. He said that National Health Policy- 2017 is focused on promotion of health. COVID-19 is a new disease with no diagnosis available. Methodology for diagnosing new diseases is lacking. All sciences whether it is chemistry, physics, botany or genetics should be integrated in Ayurveda. He deliberated further on the concept of epigenetics drawing attention to change in food

habits affecting the epigenetics over a period of time. Different food affects epigenetic factors differently in the regulation of genes. He said these epigenetic changes are responsible for decrease in infectious diseases and increase in Non-Communicable disease (NCDs). He discussed about tissue development. One type of tissue can generate another type of tissue just like stem cells. For this science and Technology integration with Ayurveda is required. Institute of Genomics and Integrative Biology (IGIB) is working on a project Prakiriti Genomics. Genomic profile of a person leads in the diagnosis, treatment and future prospects. He concluded by saying that physics, chemistry, biology all should be together, should be under one room, and should integrate with one another.

Ancient medicine and herbal medicine are two different systems

- **Herbomics is the new science dealing with effect of herbal medicine on your body**

Prof. Ramakrishna V Hosur (Professor, TIFR, Mumbai) emphasized that Ayurveda has been neglected for several years because of modern science. This pandemic has given us opportunity to showcase potency of Ayurveda. We have to learn from Ayurveda that how pandemics is being combated using Ayurveda. How herbal medicine affect different diseases within the body is to be elucidated. Holistic research should be done, and we have to learn from Ayurveda to replace modern medicine. India can lead the world in traditional medicine as we have rich source of herbal medicine from ancient time. New Educational Policy has focused of multidisciplinary approach. We have to use modern techniques so that we can generate new knowledge that can be propagated. He said a new area that combines herbal science with modern medicine which he termed as Herbomics should be introduced as subject and should be included in curriculum of graduate and post graduate courses. Modern science tools should be used to demonstrate Herbomics. There must be trained teachers and specialized departments of Herbomics in research institutes and universities. All subjects such as chemistry, physics and biology should be used to understand effect of Herbomics on different metabolic pathways. In India people having post doc from foreign university/institute are appointed as Assistant Professor/Scientists/Some other position neglecting people having post doc from Indian universities/institutes. This mindset has to be changed. We must encourage our own people. There should be multidisciplinary approach and degree programs such as B.Sc./M.Sc. in Herbomics. Interdisciplinary educational/research institutes and infrastructure for that should be created. Yoga has been demonstrated by India to the world. Yoga keeps balanced state of mind and body. When you will be in balanced state you will be happy and healthy. He concluded by saying that HEAR (Holistic Education and Research) should be promoted. Excellent thesis can be done from our traditional knowledge, this will fulfill our dream and we can lead the world in this.

Ayurveda is a medical system that deals health in all aspects

Prof. Rama Jaisundar (Head, Department of NMR, AIIMS, New Delhi) elaborated that Ayurveda is a medical system that deals health in all aspects; physical health, mental balance, spiritual well-being, social welfare, environmental considerations, dietary and lifestyle habits, daily living trends and seasonal variations in lifestyle. There are two aspects of studying Ayurveda these include (i) How to understand Ayurveda disease care system, and (ii) scientific curiosity to understand Ayurveda medicine and system work. Another aspect is of concept of validation that is how system worked in ancient time? Ayurveda has been used as healthcare provider for ancient time. Current COVID-19 pandemic posed risk on healthcare, and the question arises, how the AYUSH system has been used in current pandemic. Doctors are treating COVID-19 patients through AYUSH practices and patients are getting recovered within 4 to 5 days with no COVID-19 systems. They are being sent home after their report come negative for COVID-19. But there is either under reporting or no reporting of such treatment. Therefore, we need complete documentation of this treatment given to COVID-19 patients by using AYUSH system, this will help us in future pandemics. Modern medicine believes that virus is causing factor for currents COVID-19 pandemic, while, Ayurveda system believes that virus is triggering factor rather than causing factor for current pandemic. Further modern medicine focuses on unknown factor, while, Ayurveda focus on known factor. This gives advantage to Ayurveda over modern medicine as more you focus on unknown factor more you be in trouble system. These are the fundamental difference between Ayurveda and modern medicine system. For their integration we need to deeply understand these two systems. Ayurveda use matrix for treatment or we can say it gives comprehensive package as opposed to modern medicine in which single targeted molecule is given. Poly-herbal formulations are used in Ayurveda for treatment of patients. If we want to integrate Ayurveda with modern medicine, there should be proper design of experiments, methodology of experimentation and clinical trials should be done for Ayurveda formulations. Both systems are right in their own way we need to understand both.

How to live in harmony with nature: Principle of Ayurveda

Shri Jayant Sahasrabudhe (National Organizing Secretary, VIBHA) gave in-depth insights of how one can live in harmony through Ayurveda. Ayurveda has been working on conventional scientific knowledge since time immemorial. Ayurveda deals with the principal that "How to live in harmony with nature?" Cycle that goes on inside the body has close relation with the cycle that goes on in the nature. We changes our food habits with seasons (i.e. in different seasons we eat different food for example in India we use millets in winter while wheat/rice in summer). There is a need to understand many aspects of traditional science. Traditional medicine is basically preventive, rather than curative. It is not for pandemics rather its prior use to prepare us for fighting these pandemics. We have to be always careful about our health. Our traditional knowledge has helped our country and will help in future as well. How to live in herbalmic nature? How to live balancing with nature? Ayurveda is a good example of it. In 2017 Noble prize was given in health sector for circadian rhythm. Ayurveda has similarity with this kind of rhythm of our body and nature. We must look to all the different aspects of Ayurveda. Ayurveda teaches us to be aware

about ourselves and nature. It's necessary to be aware about health and traditional knowledge of country teaches it.

Collective Intelligence Policy Interactive Discussion
(Moderated by Prof. Rupesh Chaturvedi)

The big difference between modern medicine and Ayurveda is precision medicine and precision wellness. In modern medicine we use concept of precision medicine i.e. a single compound is used against target. While in Ayurveda we use concept of precision wellness i.e. different compounds are used in synergy. This is more appropriate to use compound in synergy. Mindset to use Ayurveda is required, use of synergy of compounds is required as singe of them may not be useful. The bad luck is that western journals will not accept it. Therefore, we should use modern techniques to show how compounds act in synergy.

Ayurveda also deals with precision of diagnosis, there are specific patterns in methodologies in Ayurveda. We have to understand the pathogen very precisely then precise treatment should be designed. Western medicine initially has one molecule one target, then it start identifying one molecule many targets. Ayurveda on the other hand identifies multiple molecule multiple targets for example triphla, it contains three myrobalans taken without seeds these include Amalaki, Bibhitaki and Haritaki. And it has antioxidant, anti-inflammatory and anti-bacterial effects.

There is general misconception that herbal medicine and Ayurveda is same. These two are entirely different. There is a question of how to integrate modern medicine and Ayurveda, so there should proper methodology to integrate different systems of medicine.

Ayurveda is very well regulated in India as modern medicine. There are central and state regulating agencies for Ayurveda and homeopathy etc. There are certification and registration for Ayurveda doctors as well. Ayurveda doctors have to renew their registration every five years. Recently in 2017 our honorable Prime Minister released Guidelines for AYUSH, these are available on website of ministry of AYUSH.

In modern medicine quantification of compound is done. While in Ayurveda plant extract is taken. Chemical composition of different compounds is different in plants from different locations, so how to decide dose in AYUSH system. The reply was, there are well established standards for AYUSH. These include GMP standards and WHO standards also. Ayurveda never specifies use of particular species rather it specifies quality of extract/medicine. If Ayurveda specifies plant species this may pose huge load on particular species and that will become extinct. We can come out with diagnostic tools, modern methodologies using modern techniques, we can come out with certain biomarkers based on Ayurveda. This will help in validation of Ayurveda medicine as modern medicines.

Impact of traditional versus modern life style on Indian medicine: a citizen science approach:
(A detailed presentation was given by Dr. Anil Koul on this aspect)

All the diseases are linked to fallacy of life style and economic growth. Life style disease like CVD, Diabetes, liver cirrhosis etc. are increasing day by day. Healthcare is one of the key innovations in last 10 years. Few example of disruptive innovation medicine include-HIV and HCV, Immune-oncology and targeted cancer therapy, stem cells, CAR-T and CRISPERs, HPV and Streptococcus Vaccine, Bionic limbs, fMRIs, precision diagnostics and laparoscopic surgery, digital health and big data analytics and e-health records. Discovery of Bedaquiline (a drug used in Drug resistant TB (DR-TB)) is registered in across 64 countries.

- **Validation of Ayurveda practices via modern biology tools**

System biology approach to delineate molecular signatures for principals of Ayurveda is needed. Modern biology and clinical tools for validation of Ayurveda practices include- (i) immune checkpoints and Ayurveda ideas (PDL-1 etc.), (ii) biomarkers/bio-signatures/epigenetic profile of Ayurveda states/outcomes, (iii) randomized and placebo- controlled trials, (iv) the study of drug synergism- why so relevant to Ayurveda?, (v) immune genomics and immune signature, (vi) digital mapping/omics of Ayurveda and clinical outcomes, and (vii) impact of YOGA/traditional practices to mental health.

- **Impact of food, action and thoughts on lifestyle**

It is generally believed that increased fruit and vegetable intake, decreased sugar intake, increased physical activity and decreased TV/Screen time contribute to good health. Apart from these two, less studied risk factors contributing to good health are stress and sleep. However, Indian adolescents have reported with poor food consumption pattern making them susceptible to disease. Diseases like diabetes and hypertension are linked to dietary and physical activity behavior. India is the world's largest diabetes capital; there were 26M cases of diabetes in India in 1990 which raised to 65M in 2016. Similarly cardiovascular cases were raised from 25.7M in 1990 to 54.5M in 2016.

- **The human microbiome is next revolution**

How Ayurveda is connected to gut microbiome need to be studied. Studies are focusing on how dietary intake and food habits have affected human micro biome. This study is very relevant as both oral and gut microbiome have major influence on human health. When do we sleep, what do we eat and when we eat affects human microbiome.

About Samvigyan Project

- **The goal is to link young people with their national and cultural origins**

Dr. Anil Koul (Vice President Johnson and Johnson) presented Samvigyan project which is based on human microbiome. In this project human microbiome of school going children between 14 and 16 years of age will be studied. The project aims the exposure of national research laboratories to school going children. Samvigyan Project focuses on four major areas: Microbiome, Chronobiology, Genomic revolution and Data Analysis. Objectives of Samvigyan Project include:

student oriented learning program for linking life style with modern, the role of traditional life style versus modern life style vis-à-vis the microbiome and genomic understanding, creating awareness and technological know-how through project based learning among younger generation and connecting the younger generation to the national laboratories. This will provoke scientific curiosity among students. Samvigyan Project is based on three modules: first-genomics and microbiomics, second-data interpretation and linkages to traditional life style, third-interactive hands on project based learning. Perceived challenges to Samvigyan Project are: incentives to research laboratories and PIs to participate, the interest of the schools to participate, a big learning approach, sustained effort over years, finance this activity over years and lastly, identifying the trained in this field and incentives.

Key Recommendations

- Integration of modern and traditional medicine will require well defined protocols, methodologies, framework and set of policies and regulations.
- We have to learn to respect the ayurvedic and herbal medicine and one must see how one can take it forward for the benefit of society and benefits of ourselves worldwide.
- To link young people with their national and cultural origins: to raise understanding among young people of the influence of traditional lifestyles and modern lifestyles and their differences.
- Young people need to be familiar with circadian rhythm and genomic transition.
- To encourage dietary improvements by consuming more fruits and vegetables, reducing the consumption of calories, increasing physical exercise and reducing the screen time.
- Validation of Ayurveda medicine as modern medicines is needed.
- CSIR-NISTADS need to develop communication tools/strategies to disseminate science/knowledge to common people.

The Policy Session ended with Vote of Thanks by Dr. Madhulika Bhati.

Contributors in Collective Policy Session Report Preparation:

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