



Ministry of Environment, Forest
& Climate Change



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**REPORT OF THE ONLINE WORKSHOP
ON
THE USE OF HAZARDOUS PESTICIDES AND THE IMPACT ON
ENVIRONMENT AND HEALTH: LEGAL AND SOCIAL IMPLICATIONS**

**ORGANISED BY
CENTRE FOR ENVIRONMENTAL LAW, EDUCATION, RESEARCH AND
ADVOCACY (CEERA),
NATIONAL LAW SCHOOL OF INDIA UNIVERSITY, BENGALURU**

**IN COLLABORATION WITH
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE, NEW
DELHI**

Date: 18th December, 2020

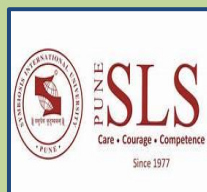
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ACKNOWLEDGEMENT

The Centre for Environmental Law, Education, Research and Advocacy, expresses its gratitude to the **Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India** for granting the Three-Year project on “*Collaborative Engagement for Research, Training and Development in Handling of Chemical and Hazardous Waste*”. We express our sincere thanks to **Ms. Geeta Menon**, Joint Secretary, MoEF&CC. **Dr. Dharmendra Kumar Gupta** Director/Scientist-F Hazardous Substances Management Division, MoEF&CC, and to **Mr. Dinesh Runiwal**, Scientist-D Office of Hazardous Substances Management Division, MoEF&CC for their guidance in this project.

CEERA would like to show appreciation to its regional partners in this project -**National University of Juridical Sciences, Kolkata, Bennett University, Greater Noida, Jagran Lakecity University, Bhopal Symbiosis Law School, Pune and School of Law, CUSAT University, Kochi** for their engagement in successfully conducting this workshop.

We acknowledge the contribution of Prof. Shashikala Gurupur, Dean, Symbiosis Law School, Pune; Prof. Yogendra Srivastava, Professor and Dean, School of Law, Jagran Lackecity University, Bhopal; Prof. Sandeepa Bhat, Professor of Law, West Bengal National University of Juridical Sciences; Prof. Nuzhat Parveen Khan, Dean, School of Law, Bennett University and Prof. Vani Kesari Director, School of Legal Studies, CUSAT, Kochi in this workshop.

We are thankful to Prof. (Dr.) M K Ramesh, Professor of Law, NLSIU our mentor, for supporting us in all our endeavors, providing his expert insights and for his encouragement to the entire of CEERA in organizing different technical workshops and capacity building programmes.

We would also like to thank all our Participants who participated in this workshop and contributed to the deliberations.

Prof. (Dr.) Sairam Bhat

Professor of Law and Coordinator,
CEERA, NLSIU

INTRODUCTION

ABOUT THE WORKSHOP:

The Online Workshop was organized under the aegis of a Three-Year Project granted to CEERA by the Ministry of Environment, Forest and Climate Change titled “*Collaborative Engagement for Research, Training and Development in Handling of Chemical and Hazardous Waste*”. The broad objectives of this project *inter alia* include, providing advisory to the Ministry on matters connected to the Conference of Parties under various Multilateral Environmental Agreements, to which the country is a party including the Rotterdam Convention on Prior Informed Consent that deals with Hazardous Pesticides. The workshop aimed at fulfilling one of the mandates given by the Ministry, which includes conducting stakeholder consultations and capacity building programmes to build awareness about the different laws and policies that govern the chemical and hazardous waste sector.

The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade is a collaborative effort for the promotion of human health and environment. It furthers these goals through mandating the exchange of necessary information through the principle of ‘prior informed consent’ on several *hazardous industrial chemicals* and *pesticides* and the maintenance of transparency in the international trade between parties. The aim of the Rotterdam Convention is to encourage sustainable efforts amongst State Parties in the international trade of certain hazardous chemicals so that human health and the environment can be protected from potential harm, and to ensure the environmentally sound use of such chemicals.



India ratified the Rotterdam Convention on 24th May, 2005. In pursuance of the mandate of the Convention, India has authorized the Ministry of Environment, Forest and Climate Change, Ministry of Chemicals and Fertilizers and the Ministry of Agriculture and Farmers’ Welfare to perform the role of national authorities that undertake the functions of administering the Convention in the country. India has enacted laws and rules for the regulation of pesticides both prior to and after the ratification of the Rotterdam Convention. However, a comparison between the legislative provisions enacted for the regulation of pesticides in India and the mandate of the Rotterdam Convention reveals that there is a still a long way to go before the country can be said to be fully compliant with the requirements of the Convention. A comparison between the Insecticides Act, 1968, Insecticides Rules, 1971 and the Rotterdam Convention reveals that while the Convention deals with bans of pesticides, insecticides and chemicals that harm the environment, wildlife and human life, the ambit of the Act and Rules in India only encompasses human beings and animals, with very little reference to the environment. Another significant drawback of the Act and Rules is that many insecticides that have been banned by Annexure III of the Rotterdam Convention are still in use in India.

India has ratified the Rotterdam Convention, but domestic laws that fully embody the principles of the Convention are yet to be formulated. The Pesticides Management Bill, 2020 intends to replace the Insecticides Act, 1968, and regulate the manufacture, packaging, import, labelling, storage, pricing, sale, advertisement, transport, use, distribution and disposal of pesticides, to ensure the availability of safe and effective pesticides. However, after the outbreak of the corona virus pandemic, no further progress has been made in this respect. The continued use of hazardous pesticides has deleterious effects on human and animal health and the environment, the consequences of which transcends generations, and must be curbed. In light of this, the workshop was organized by CEERA, NLSIU to deliberate on and build awareness about the laws governing pesticides in India and to study the implications of the continued use of hazardous pesticides on health and the environment.

The Workshop covered deliberations and invited paper presentations on the following topics:

- ❖ Regulatory and Legal framework on the manufacture and use of pesticides.
- ❖ Pesticides and Agricultural Sector
- ❖ Pesticides and their Economic Implications in the Chemical Sector
- ❖ Environmental Degradation and Pesticides.
- ❖ International Trade of Chemicals and Pesticides.
- ❖ Health Implications of the use of Pesticides

There were 114 registered participants at the workshop. The participants included officers of pollution control boards, industry professionals, legal professionals, students and academicians from environmental sciences and agricultural universities. This report gives a detailed description of the proceedings of the workshop.

ABOUT THE INSTITUTIONS:

NATIONAL LAW SCHOOL OF INDIA UNIVERSITY, BENGALURU

The National Law School of India University, the Nation's premier law university, came into existence through a Notification under the National Law School of India University Act (Karnataka Act 22 of 1986). It signified the culmination of efforts by the Judiciary, the Bar Council of India, the Karnataka Bar Council, the Bangalore University and the Government of Karnataka to reform legal education and to establish a centre of excellence for legal education and research in India. The Law School has undertaken many research projects funded by the UGC, the Government of India, the Government of Karnataka, the Department of Women and Child Development, UN agencies, the World Bank, HIVOS, Department of Justice etc.

The Projects have served to strengthen research and teaching at the Law School. The National Law School since its inception has taken proactive steps in organizing conferences, seminars, workshops, refresher courses and certificate courses to update academicians, law teachers, students, industry personnel in different subject areas.

Centre for Environmental Law, Education, Research and Advocacy (CEERA)

The Centre for Environmental Law Education, Research and Advocacy, established in 1997 in the National Law School of India University, Bengaluru is a benefactor of the Ministry of Environment and Forest and Climate Change(MoEF&CC), Ministry of Law and Justice, Government of Karnataka, the Bar and the Bench in India and several Institutions and Universities abroad. Building an environmental law database, effectively networking among all stakeholders, building up an environmental law community and policy research in the area of environment are CEERA's main objectives, although the Centre has also forayed into the fields of contractual management, right to information, urban development laws, water governance and agriculture. CEERA has been the steady choice for the Ministry of Environment Forest and Climate Change for training Officers of the Central Pollution Control Board and State Pollution Control Boards on Environmental Legislations and has been conducting training workshops for the officers for the several years now.

One of the first in India, to be granted a five-year World Bank project on Environmental Law capacity building and thereafter being a steady choice for the Ministry of Environment Forest and Climate Change, CEERA has been entrusted with research projects and workshops to impart training to Forest Officers, Revenue Officers, Officers of the Central Pollution Control Board and also of the Government of Karnataka. CEERA is proud to have completed a two- year Research Project granted by the United Nations Development Programme (UNDP) under the Global Environment Facility (GEF), and as one of the deliverables, organised, convened and conducted over twenty workshops at Institutions of national repute creating awareness on the Biodiversity Law and Access and Benefit Sharing (ABS) in less than 2 years. Two research publications on a minimal research area of biodiversity laws were also the outcome of this project.

CEERA has also made several publications in the area of environmental law, the law and public policy along with Newsletters, CEERA March of the Environmental Law, NLSIU's first e-Journal – Journal on Environmental Law, Policy and Development [UGC care listed] and manages two websites viz., www.nlsenlaw.org, wherein the law and policy on Environment is regularly updated, and www.nlsabs.com, a dedicated portal wherein the law and policy on Biodiversity Access and Benefit Sharing is updated periodically. All our publications are duly updated on our online portal www.nlspub.ac.in, which is open for subscription to all readers.

Ministry of Environment, Forest and Climate Change and the Project:

The Ministry of Environment, Forest and Climate Change is the nodal agency in the administrative structure of the Central Government for the planning, promotion, co- ordination and overseeing the implementation of India's environmental and forestry policies and programmes. It is also the nodal ministry for Chemical and Waste(C&W) related Multi- Lateral Environmental Agreements (MEAs). MEAs are a set of legally binding or voluntary instruments which comprise of the policy framework intended to promote chemical safety, prevent environmental pollution, eliminate/reduce adverse impacts on human health and promote sustainable development. The Ministry of Environment Forest and Climate Change and CEERA, NLSIU have entered into MoU for three years to assist and support the Ministry in coordinating and implementing the matters related to the Chemical &Waste related Multilateral Environmental Agreements and to:

- Introduce and establish a programmatic approach to handling C&W MEAs in MoEF& CC.
- Identify and develop long-term strategic partnership to provide key legal, policy and strategic inputs to the Ministry in the management of C&W MEAs.
- To act as a repository of knowledge and create as well as maintain database for C&W MEAs related issues in the country and MEAs related matters.
- To assist and support MoEF&CC during national and international meetings on C&W MEAs and related matters.
- Conduct demand driven and follow up research to assist in the negotiations and issues pertaining to the Convention that could help in strategizing the national priorities.
- Conduct stakeholder consultations, capacity building programmes and network with other institutions and agencies.

SUMMARY OF PROCEEDINGS

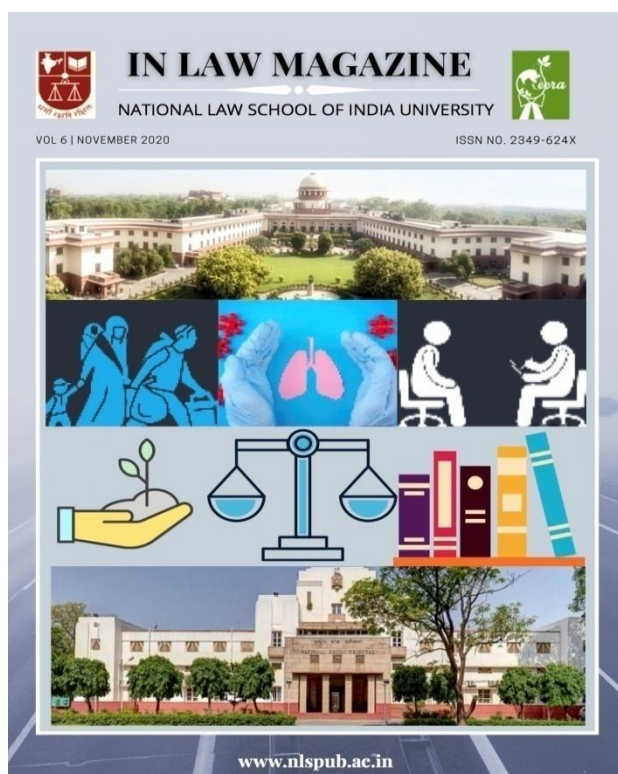
SESSION 1 - SETTING THE TONE AND KEYNOTE ADDRESS

The online workshop on ‘The Use of Hazardous Pesticides and the Impact on Environment and Health: Legal and Social Implications’, commenced with a welcome address by **Ms. Madhubanti Sadhya**, Teaching Associate, CEERA, NLSIU. A brief introduction about the Centre’s activities, initiatives and research projects was given to the participants. **Ms. Geetanjali KV**, Legal Associate, CEERA, then discussed the launch of the 6th volume of the IN Law magazine by the Centre. IN Law Magazine has been one of the esteemed publications and has been catering to contributions on contemporary areas of legal research. The Magazine contains shorter research articles that are interdisciplinary in nature and also contemporary and relevant for the common man. The sixth volume contains selected articles from the 2 webinars had hosted by the Centre and the broad themes discussed include NGT, Corporate Environmental Responsibility, environmental justice etc. The volume also features interviews of prominent legal personalities and a book review.

The launch of the **IN Law Magazine** was followed by the keynote address by **Prof.(Dr.)M. K. Ramesh**, Professor of Law, NLSIU, Bengaluru. Dr. Ramesh spoke about the importance of the workshop not just in terms of creating awareness but also to conscientize the policy makers and law makers as to the kind of challenges before them in giving effect to our obligations under the Rotterdam Convention. The objectives of the workshop, of acquainting the participants of the law

governing pesticides, were manifold according to him. He stated that it is essentially to bring to notice all the concerns, especially the policy makers, policy implementers and those that are actually in the field that there are certain issues which need to be addressed, concerning pesticides.

He stated that we know of the law concerning hazardous chemicals which are a part of the environmental legal regulations. We are also aware of the kinds of concerns expressed by the higher courts of law on the way in which hazardous chemicals have been managed them over time from the 1980s till today. The Courts have time and again insisted on developing a proper inventory and database of chemicals and hazardous substances that are stored, stacked, made available, put to use - including hazardous



pesticides. The same has been conveyed to the regulatory authorities that there is a need for equipping and educating those who actually handle these hazardous chemicals. He cited the example of the Bhopal Gas Tragedy and stated that it is time we learnt our lesson and corrected things. In this context, he referred to the Draft Pesticides Management Bill, 2020, which is supposed to replace the Insecticides Act, 1968 - the law in relation to insecticides. However, he wondered whether the new law would accommodate the other obligations that the country has undertaken at the global level? How many of those concerns that we were supposed to be addressed subsequent to the drafting of the insecticides law find place or expression in the new bill, is questionable, according to him.



Professor M.K. Ramesh noted that at the core of tackling the issue, lies the coordinated, concerted and harmonious efforts of several Departments and Ministries of the government. The Ministries of Industry, Health, Ministry of Environment Forest and Climate Change and Agriculture are the four prime industries involved in the field, but water resources are also affected by the use of pesticides. Whether such factors will find contemplation in the body of the new law needs to be examined. Professor Ramesh stressed that it is not just coordination between Ministries to ensure the working of the law on pesticides that is important, but coordination and facilitations to ensure proper implementation of the Rotterdam Convention. He emphasized on the importance of the different Ministries coming together to engage in a meaningful dialogue with each other on the proper implementation of the laws. He stated that CEERA is getting into this exercise in a very impactful way and thanked the MoEF&CC for trusting NLSIU with the intricate and delicate task of bringing the real actors - policy and law makers of India to come together to develop, improve upon and reform the entire law concerning hazardous pesticides.



Another important point flagged off by Prof. Ramesh was the question - how does this new law apply the principle of Precaution and Extended Producers Responsibility. In terms of prescribing the duties and obligations of various actors including the manufacturers, there are provisions in the law but how does it really bind the

producers of hazardous substance to perform their obligation under the principle of EPR will have to be seen. Prof. Ramesh also stressed on the need of reflecting on the different court orders that have been delivered over time. Have any robust provisions been made for ensuring inventorization - starting from production, export, import to the stage of ultimate consumption, use and disposal. Whether these orders have been conformed with is something that was required to be reflected upon. He further raised questions like what kind of penal provisions were in place to ensure compliance. In conclusion, Prof. Ramesh noted that the issue was not just about the availability of safe and effective pesticides - the mandate is much greater and requires one to consider questions such as- How safe? Should it just be safe for human and animal health or even ensure environmental safety and bio-safety?

Taking over from Prof. Ramesh, Prof. (Dr.) Sairam Bhat, Professor of Law and Coordinator, CEERA thanked and welcomed all the coordinators from partner institutions. **Prof. (Dr.) Sairam Bhat** commenced the session with a brief overview of the range of concerns with respect to pesticide use in India. He stated that while pesticides have immense benefits in the field of agriculture, in helping farmers in terms of productivity, protection of crops etc, contributing to food security, however, the hazards they pose should not be forgotten. It is important is to recognize the hazards and challenges from the abuse, not use, of pesticide, according to him. The use of pesticide is a very important area for concern, not only from a health perspective but also in terms of its use in agriculture - contaminating soil and groundwater. The kind of health safety farmers have when they are using pesticides is something worth looking into. He pointed out how when we speak about environment health and safety in industries, we expect workers in the industry to have adequate gear or equipment when they take part in industrial activities. But our farmers spray these pesticides across agricultural lands without any gear.

Hence this debate on the use of pesticides has huge ramifications for the society and it is time to revisit the laws and regulations on pesticides. He then discussed a case in the Supreme Court from 1997 - *Dr. Ashok v. Union of India*. The case was initiated because of a letter that Dr. Ashok had written to the Chief Justice of India of the Supreme Court, raising the concern of the use of chemicals in agriculture. The CJI then converted this letter into a Writ Petition. Dr. Ashok stated that there were many such pesticides and insecticides that were banned in other countries but were continually used in our markets. Therefore, Dr. Ashok asked for a more effective and robust system of registration and monitoring of pesticides in the country.

The case raised an important point that we must bring together a robust regime that looks at not only manufacture, but also distribution, sale, transportation and storage of agrochemicals. But Prof. Bhat also emphasised on one of the key factors in hazardous chemical management that is labelling –the consumers have the right to know the hazards that a pesticide poses to the human health. He said that what is important to note is that there are also advertisements for pesticides.-He stressed on the need of bringing together regulations and provisions for responsible advertisement in the pesticide sector, considering the vulnerability of farmers.

He further stated that while the Ministry of Agriculture is the nodal agency in the pesticide sector, FSSAI also regulates the pesticide residue in food. So, we have another agency that has come into the sector, calling for coordination between different agencies of the government. Hence, Professor Bhat said that we must look at pesticide not only from the perspective of the agriculture sector but also from the point of the right to food and human health. Finally, he stated that it is important to bring in the aspect of POPs- Persistent Organic Pollutants. The interesting part is that under the Conventions that regulate POPs including the Stockholm Convention, a lot of the chemicals used in pesticides are banned. In fact, Dr. Ashok’s case also brought up the use of asbestos and the kind of impact it had on human health. This, he noted clearly brings to the forefront the fact that in India, we not only need a strong regulation on chemicals we also need a strong implementation mechanism in which these chemicals can be used in a much more responsible and sustainable manner. While concluding Prof. Bhat said, that this was one of the key emphasis of the workshop, which he said would benefit everyone not only as stakeholders, but also as responsible citizens of the country.

SESSION 2

Session 2 workshop had two speakers, who highlighted the legislative framework for the governance and regulation of pesticides in India. Ms. Madhubanti Sadhya discussed the Indian laws governing the import, manufacture, sale, transport, distribution and use of insecticides primarily the Insecticides Act, 1968 and the Insecticide Rules, 1971 and the obligations of the country under the Rotterdam Convention. The second speaker, Dr.T.N. Prakash Kammardi, Former Chairman, Karnataka Agricultural Price Commission highlighted the principal features of the Pesticides Management Bill, 2020 besides discussing some basic aspects of agricultural economics. The session

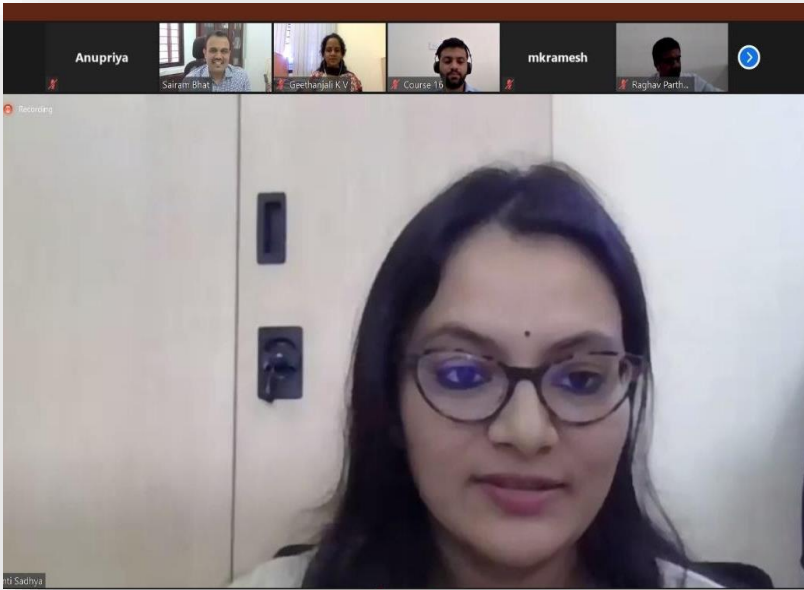
was moderated by Dr. Vani Kesari, Director, School of Legal Studies, CUSAT, Kochi. and Mr. Rohith Kamath, Consultant, CEERA, NLSIU.

OVERVIEW OF THE INDIAN LAWS GOVERNING PESTICIDE

Ms. Madhubanti Sadhya explained the technicalities of the existing pesticide regulation regime in an elaborate and insightful manner. This segment began with an introduction into the origin of the term pesticide which utilises the Latin suffix “cide” which translates to “killer”. Therefore, pesticide is a pest killer, and an umbrella term used for substances used to kill, repel or control certain forms of plant or animal life that are considered to be pests. The compound annual growth rate of the Indian pesticides industry in the year of 2019 was 14.7%, which suggests that India is a major producer of pesticides. Thereafter, she went on to discuss some important statistical figures which helped the participants understand the involvement of the pesticide industry and the extent of the said involvement. Pesticide production is comparatively low (2%) compared to other chemicals according to the Department of Chemicals & Petrochemicals (2018). Pesticide import is also comparatively low (1%) when compared with other chemicals as per the statistics provided by the Department of Chemicals and Petrochemicals (2018). However, as per the statistics provided by the Department of Chemicals and Petrochemicals, the rate of export of pesticides (24%) is the second highest when compared against other chemicals in India. It is therefore the need of the hour that India is responsible in its export practices when concerning pesticides.

The Rotterdam Convention on Prior Informed Consent which India ratified on 24th May 2005 created many obligations for the country. The Convention itself entered into force in February 2004 and covers the regulation of pesticides and industrial chemicals which have been banned or severely restricted for health or environmental reasons (Annex III). Ms. Madhubanti discussed the concepts of Prior Informed Consent under the Convention, the Decision Guidance Document and the importance of import response and Final Regulatory Action that a state can take. She also identified India’s obligations as per the Rotterdam Convention which includes the following:

1. Appointing National Authorities- Ministry of Environment, Forest and Climate Change, Ministry of Chemicals and Fertilisers and the ministry of Agriculture and Farmer’s Welfare
2. Final Regulatory Action- Benzidine and its salts
3. 40 pesticide formulation which have been banned in India
4. 18 pesticides have been refused registration
5. Carbofuron, Methomyl and Phosphamidon banned for import and manufacture
6. Captafol Powder and Nicotine Sulfate- manufacture only export and use within the country for dry seed treatment



Moving on to highlight the primary legislations governing pesticides she briefly discussed the main provisions of the Insecticides Act,1968 and the Insecticide Rules,1971. The Act regulates the import, manufacture, sale, transport, distribution and use of insecticides with a view to prevent risk to humans and animals. Its provisions apply in addition to and not in derogation of

existing law. However, the term pesticide doesn't feature in the text of the legislation. Further, the Rules act as a supplement to the aforementioned Act and elaborate the functions of the different authorities discussed under the Act. It is worth mentioning that the Rules additionally lay down specific guidelines for packaging, labelling and transport of insecticides while addressing the treatment options for expired insecticides via additional provisions. The Regulatory authorities and their functions were discussed at length following the discussion regarding the legislations governing pesticides. The responsibilities of the Regulatory authorities including the Ministry and Department, Central Insecticides Board, Registration Committee and Licensing Officer were discussed. The supervisory and prohibitory functions of the Insecticides Act, as under Sections 20, 27, 17 and 18 were discussed as well, along with the punishments for the contravention of the said provisions.

Ms. Madhubanti then proceeded to bring attention to three primary concerns with regards to the regulation of pesticides in India. First, Section 38 of the Act does not apply to the use of insecticides for personal land cultivation, in kitchen gardens or for household purposes. This leaves a gap in understanding. What about banned insecticides? Can they be allowed for use for non-agricultural purposes? Second, the Insecticides Act and its Rules have failed to incorporate any provision on the export of insecticides. Moreover, some of the pesticides banned or restricted for usage under Annexure III of the Rotterdam Convention, continue to be used in India.

Finally, the Pesticides (Prohibition) Order, 2018 which stipulated the ban of 18 pesticides (effective August 2018) was discussed wherein the registration certificate granted under the Insecticides Act would stand automatically cancelled for the pesticides identified under the Order. The session was concluded by discussing the Banning of Insecticides (Draft) Order, 2020. This order prohibits the

manufacture, sale and use of 27 pesticides likely to involve risk to humans and animals. These include pesticides like monocrotophos which was classified by WHO as highly hazardous.

PESTICIDES MANAGEMENT BILL, 2020

Dr.T.N. Prakash Kammardi, Former Chairman, Karnataka Agricultural Price Commission was invited as a Resource Person to deliberate on the Pesticides Management Bill, 2020. Dr. Kammardi commenced his session by giving some insights on agricultural economics. He stated that we are losing 15-20% of our produce and there has been a steady increase in this loss being caused by pest attacks. He noted that the use of Plant Protection Chemical in India is 0.5 kg which is much lower than what is used in developed countries like USA. Paddy and cotton require 40% of the pesticides and 7-8 States in total consume 80% of the pesticides. In cabbage, plant protection chemical is sprayed 148% over the required levels (specific example of a place in Bangalore was given).

He stated that pesticides are designed to kill and have a spill-over effect. Reckless use by farmers has a strong co-relation with harmful effects on humans. When people consume food highly infused with chemical, they become prone to diseases, allergies, etc. When lactating mothers eat contaminated food, the quality and quantity of milk production is affected, impacting the health of the young child



as well. Social benefit ratio of pesticides is an approach in vogue in developed countries. Customers in richer countries have become conditioned to demand that their food is free from all impurities. This means that pests have to be eradicated rather than simply reduced to a level where nutritional, rather than aesthetic or cosmetic harm is negligible.

Moving on to the Bill, he pointed out that the Bill has no clarity on differences between pesticides, insecticides and weedicides. Moreover, the definition of pesticides given in the Act needs to be relooked. Pesticides do not kill but repel pests and affect reproduction and fertility. The term poisoning should not be used as it is a colloquial terminology. He pointed out that Resistance and Resurgence Ecosystem is missing from the Bill. This means that primary pest resurgence and replacement of a primary pest by a secondary one are important consequences of chemical pest control in agricultural systems. This resurgence occurs because even though the pest is removed,

pesticides also cause changes in pests' behaviour, dispersal, development indicating that resistance cannot solely tackle the nuisance caused by pests. He further noted that the Bill does not regulate pricing. Compensation fund has been provided for but people have to go to Consumer Court and that may take time. Further, the Bill provides for a Registration Committee. However, this may not be good and an independent body should have been constituted. There are also some genuine concerns such as the need for a time-bound, predictable, stable, and transparent process for registration of products which need to be addressed immediately by the Government. Farmers need improved agronomic support and practices which can help in increasing their crop yields. There is a need for fast track transparent time-bound online registration system. It will be desirable to ensure the participation of industry representatives in the Central Insecticides Board and Registration Committee.

He stated that like everything else, the Bill also has good, bad and ugly aspects. The good thing is that enormous importance is given to sharing of vital information to farmers. An important focus of the Bill is on labelling and leaflets. Manufacturers will be required by law to specify clear and specific information on material and chemical composition, and dosage of use. The leaflets must carry this information in the local language to ensure that farmers are properly informed. This is critical since there is a huge tendency to overuse pesticides by farmers, often driven by not having enough information on the correct usage. Maximum residue limit will also be provided. The regulations are stringent in nature, which will ensure compliance.



Apart from discussing the essentials of Bill, Dr. Prakash also mentioned that hazardous chemicals should be highly taxed and organic pesticides, crop rotation, etc should be liberally allowed. Regulations should not be on farmers alone. Farmers should follow maximum residual limit and there should be regulation of trade on agrochemicals. He ended the session by saying that in order to tackle problems caused by pesticides, public awareness is key. If public demands better quality food, anti-food adulteration regulations are used to fight the menaces caused by harmful inorganic substances, then, food quality will surely improve. This session was followed by a few questions posed to the resource persons that were moderated by **Dr. Vani Kesari**, Director, School of Legal Studies, CUSAT, Kochi.

SESSION 3

The session commenced with the moderators of the session, **Mr. Praveen Tripathi**, Assistant Professor, School of Law, Bennett University, and **Mr. Raghav Parthasarathy**, Teaching Associate, CEERA, NLSIU, introducing the resource persons, **Prof. (Dr.) Sandeepa Bhat B.**, Professor of Law, WBNUJS and **Prof. (Dr.) Yogendra Kumar Srivastava**, Professor and Dean, School of Law, Jagran Lackecity University, Bhopal. The session primarily dealt with the international trade aspects of hazardous pesticides. Mr. Praveen Tripathi introduced the topic to the participants by stating that there has been a slowdown and a negative growth in chemical industry in the country ever since 2008 global recession.

TRADE IN CHEMICALS AND PESTICIDES AND THE WTO REGIME

Prof. (Dr.) Sandeepa Bhat started the session by posing a question to the participants: Whether the World Trade Organization (WTO) is anti-environmental? Environmentalists claim that the actions of the WTO have been against the environment due to three main reasons:

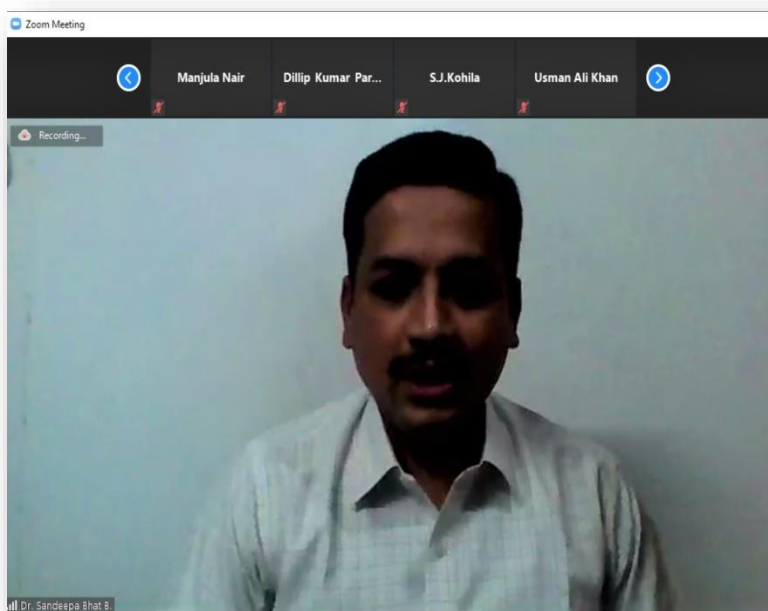
1. WTO promotes trade liberalization; hence there is an increased production world-wide, and with the improved industrialization, there is a greater exhaustion of natural resources. As a result of increased production, more wastes are also being generated, the disposal of which poses a serious challenge to countries as well as the environment.
2. With increased production and industrialization, there is also improved transportation and movement of goods. This, in turn, increases carbon dioxide and greenhouse gases emission into the environment, thus polluting the air.
3. Developing countries and Least Developed Countries (LDCs), in their zeal to get into trade relations with other countries for concessions, are being exploited with the trade of hazardous chemicals. Environmentalists claim that States may allow free and open market access with other countries in order to stimulate economic growth. However, this can lead to dumping of hazardous wastes and chemicals in the developing countries and their continued exploitation.

However, Prof. Sandeepa Bhat remarked that the WTO has never acted prejudicial to the environment. He stated the Preamble of Marrakesh Agreement establishing the WTO has, while

allowing for the optimal use of world’s resources in accordance with the objective of sustainable development, sought to protect and preserve the environment. Therefore, with the development of Environmental Law, WTO took environment into consideration while dealing with trade and sustainable development.

He explained various provisions in the international trade treaties such as Article XX (b) of the GATT – General Agreement on Tariffs and Trade – the general exception to the provisions of GATT, and Article XIV (b) of the GATS – General Agreement on Trade in Services – in order to protect the human, animal or plant life or health as well as Article XX (g) of the GATT to conserve exhaustible natural resources. He also remarked that the WTO Agreement on the Application of Sanitary and Phytosanitary Measures – the SPS Agreement – were adopted with protection and preservation of environment as their objective. Article 27 (2) of the TRIPS Agreement also provided

that in order to protect human, animal or plant life or health or to avoid serious prejudice to the environment, the member-states may exclude from patentability inventions. Also, the Committee on Trade and Environment, formed on 1995, was also a major forum in the international level for the purposes of sorting out environmental concerns between developed and developing countries.



Prof Bhat explained that Article XX (b) of the GATT as it had reduced the burden of proof and diluted the requirement of ‘necessary’, which can be an effective tool to regulate trade in hazardous chemicals and pesticides. In the *Thailand – Cigarettes case* (1990), it was held that the respondent had to prove that they had adopted the least trade restrictive alternative. In the *Korea – Beef case* (2000), it was held that “necessary” under Article XX (b) did not mean extremely necessary but it evolved a 3-pronged test wherein the following questions had to be answered: whether the regulation pursues a legitimate goal, how is the restriction or regulation going to contribute to environmental protection and whether the regulation is more trade-restrictive than necessary. Hence, the *weighing and balancing test*, evolved from the *Korea-Beef case*. In the case of *EC-Asbestos, (2001)*, it was held that where there is a scientifically proven risk to health, the WTO member-states have the right to determine the level of protection of health that they consider appropriated based either on the quality of risk or on the

quantity of risk. It was held that the more vital the common interests or values pursues, the easier it would be to accept as ‘necessary’ measures designed to achieve those ends. In the case of *US-Gambling (2005)*, however, quite contrarily, the burden of proof shifted to the complainant, instead of respondent, to prove that the least trade restrictive alternative had been adopted.

Prof. Sandeepa Bhat then explained the European Union (EU) countries’ approach by stating that Article XX (b) was effectively used to restrict trade of hazardous chemicals. They adopted a precautionary regulatory approach rather than a risk-based regulatory approach. However, Prof. Bhat remarked that this approach had lack of scientific evidence as there can be possible misuse to bring disguised restrictions to the trade. Prof. Bhat also explained the International Environmental Law (IEL) approach to trade in chemicals and pesticides and stated that as far as IEL was concerned, there was a limited ban on the trade because of absence of consensus among countries and lack of political will. Prof. Bhat also expressed concerns over the Prior Informed Consent (PIC) in the Rotterdam Convention as it had a lack of clarity on whose consent was required for the trade of hazardous chemicals. Prof. Bhat concluded by stating that political will and consensus was required for a robust trade law on hazardous chemicals.

INTERNATIONAL TRADE OF CHEMICALS AND PESTICIDES

Prof. Yogendra Kumar Srivastava started the session by explaining the importance of chemicals in the society, agriculture, and global economy as well as the serious risks it poses for environment and human, animal, and plant health, as they can contaminate soil, air and water and damage biodiversity. Prof. Yogendra noted that as per a 2018 report by the Strategic Approach for International Chemical Management (SAICM), illegal international traffic in hazardous substances and dangerous products was a pressing problem for many countries, especially for developing and least developed countries. Illegal trade of chemicals and hazardous pesticides, as per a 2017 European Union Intellectual Property Office Study, causes a loss of 1.3 billion Euros to the legitimate industry, and approximately a 2.8 billion Euros lost sales to the EU economy.



Prof. Yogendra remarked that despite the existing international framework under the Montreal Protocol, Minamata Convention, Stockholm Convention, Rotterdam Convention, Basel Convention, International Code of Conduct on Pesticide Management etc. various gaps and challenges remain in regulating international trade in chemicals to ensure their sound management

and to reduce air, water, and soil pollution, which include enforcement, implementation, and inconsistencies among domestic regulations. Domestic rules differ because of a variety of factors, including the ambiguity in the Conventions governing the trade. These differences in national legislation incentivize trade in harmful chemicals and highly hazardous pesticides. Prof. Yogendra said that in case of the illegal trade of highly hazardous pesticides, the key stakeholders and victims are the farmers who purchase the illicit plant protection products, benefit from the low costs, but risk their own health and the quality and safety of their produce by using substandard products. He also explained a well-known case of pesticide poisoning in India in 2017 which showed the consequences that can result from the application of unauthorized herbicides. Reports revealed that at least 50 people died and about 800 were hospitalized in Maharashtra after the application of unauthorized herbicides. This was one of the worst tragedies caused due to the use of unauthorized pesticides; investigation found that Monocrotophos, an extremely toxic organophosphate banned in many countries was the source of poisoning.

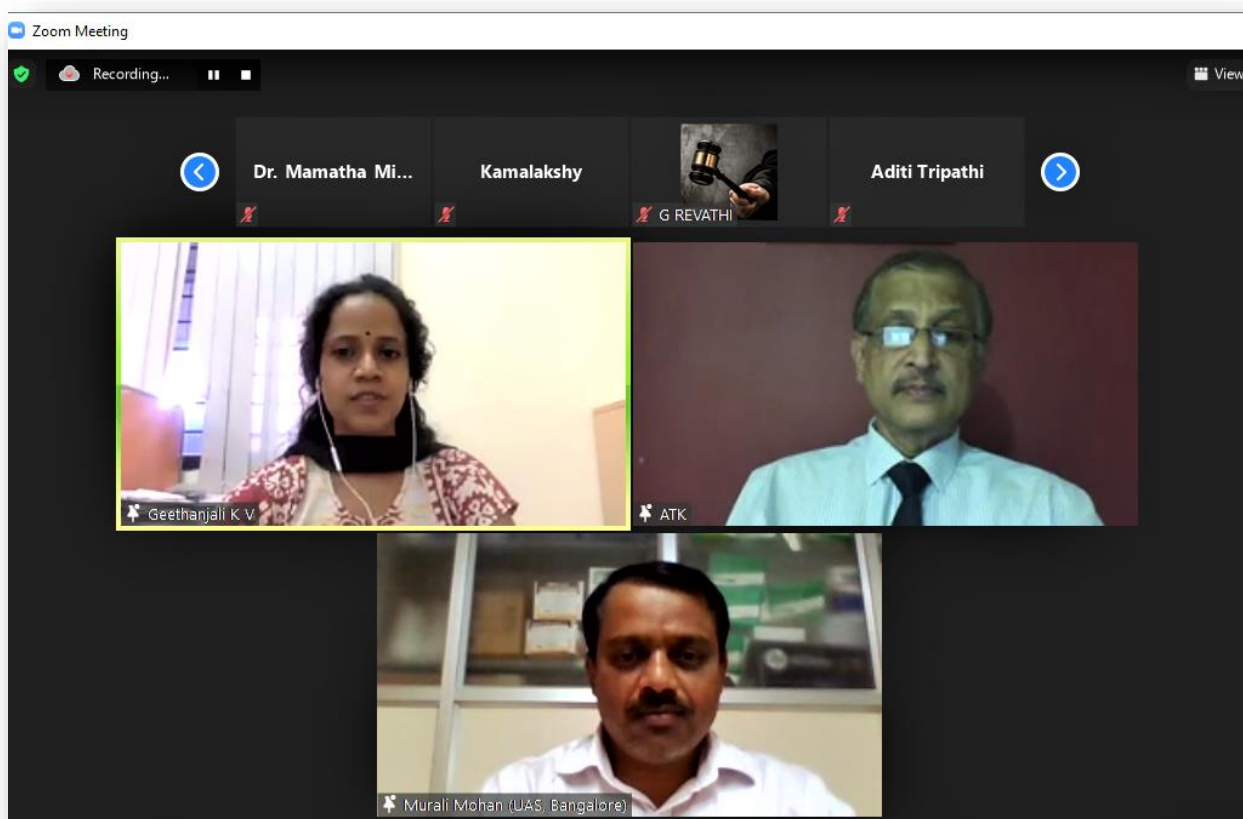
Prof. Yogendra stressed on how India has diversified chemicals industry, which now covers more than 80,000 commercial products broadly classified as bulk chemicals, specialty chemicals, agrochemicals, petrochemicals, polymers and fertilizers etc. India ranks 14th in export and 8th in import of chemicals. Also, 100% Foreign Direct Investment (FDI) is possible under the automatic route through the Reserve Bank of India in the Indian Chemical Sector. Prof. Yogendra later gave details about the 2030 Agenda for Sustainable Development. The 17 Sustainable Development goals were adopted to overcome the great challenge of how to reduce poverty and protect the environment. Several goals and specific targets feature sound chemical and waste management. Prof. Yogendra explained the important goals such as Goal 3, 6, 11, 12, 14 etc.



Later in the Q&A session, moderated by Mr. Praveen Tripathi, one of the participants asked if India could follow or draw upon from the stringent regulations of the EU. Prof. Sandeepa Bhat opined that the precautionary approach adopted by the EU is not really based on scientific evidence and also India cannot become such a precautionary regulating country. Prof. Yogendra Srivastava remarked that the amount of pesticides imported is not really reflected in the statistics of the Pollution Control Boards in India or before the court authorities.

SESSION 4

The fourth session was moderated by **Dr. Smita Pandey**, Assistant Professor, Symbiosis Law School, Pune and **Ms. Geethanjali K. V.** Legal Associate, CEERA, NLSIU. The session commenced with a brief introduction of the resource persons. There were three speakers for this session who deliberated on the harmful impact of pesticides on human health, agriculture and the biodiversity.



ENVIRONMENTAL TOXINS AND THEIR EFFECTS IN HUMAN HEALTH

The first speaker for this session was **Dr. (Col.) ATK Rau**, Paediatric Hematologist and Oncologist Former Sr. Professor and Head of the Department of Pediatrics MS Ramaiah Medical College

Bangalore. Dr. (Col) ATK Rau's session started with a brief discussion on the initial use of chemicals, pesticides and other toxins in the Indian society, with the primary focus of increasing crop yield and leading the country to become self-sustainable. The use of toxins was also being used to ensure there would be pest control, food safety and gradually it turned into a 500-billion-dollar industry.

Dr. Rau then discussed the toxic effects of chemicals and how the human genome is one of the most susceptible genomes for all types of contaminants and chemicals. He went on to mention the drastic effect that is caused due to the weak genome of human beings. The effect on the human gene pool would be caused because of consanguinity, faulty genetic patterns and the change in lifestyles of human beings in the modern world. All of this combined has an impact on the strength and the disease fighting ability of the human body which is lacking in its ability to fight the new varieties of chemicals and toxins. He also mentioned that almost 24% of the world's diseases that affect children are caused due to the environmental effects caused by the use of toxins, chemicals and pesticides.

Next he moved on to mention about the rampant delivery of underweight children and how that is one of the most drastic changes which is being seen among the newborns in modern times. He also mentioned how chemicals and pesticides have affected the anatomy and the physiology of young children which is being caused by the use of pesticides and other chemicals. Dr. Rau went on to explain as to how the highly active genes and reproductive system of the young growing children would be highly susceptible to the newly introduced toxins which they would be direct consumers of. He also spoke about Rachel Louis Carson, one of the most prominent eco-warriors and one of the first persons to understand and write about the effects of toxins on the Central Nervous System (CNS), the reproductive system and the blood of the young growing children, all of which find mention in her book "The Silent Spring" which has discussed a lot of important topics dealing with the effects of pesticides on the environment and her work eventually led to the formation of Environment Protection Agency in the United States of America. Malformations, cancers, tumours and geno-toxicity caused due to the influence of chemicals consumed. Dr. Rau shared statistics regarding precocious puberty and early sexual development. He stated that the results of consumption of such chemicals led to increased fertility, increased reproductive rate and ultimately led to increase in the population.

He explained the mechanisms of toxic action. He stated that there is evidence of structural damage in the chromosomes when associated with chemicals. The chemicals also cause functional damage of DNA which persists for generations along with mitochondrial dysfunction and oxidative stress. He addressed the question of whether environmental toxins are the cause or just associations to causes for the declining human health. He listed out the limitations encountered during research pertaining to the topic. These limitations are as follows:

- Statistics are hospital based and not population based.
- Faulty data collection and recording.

- Lack of standards, environmental and human and the variability of standards is a hindrance.
- It takes a while to see the effects of the chemical on the body.

Dr. Rau further discussed the way forward that can be adopted and stated that identification and accurate definition of the extent of the problem should be undertaken by honest field studies. The association between toxin use and its effect should be studied on the micro and macro environment level. He also stated that the researchers should undertake collection of authentic data in standardized formats while also eliminating the factors of difficulty. He subsequently mentioned the other limitations experienced by individual researchers. These include:

- Expensive nature of research.
- Varied genealogy of subjects
- Heterozygous population
- Marked difference between responses of urban and rural population.
- Limitations of animal and laboratory studies.
- Interference from vested interests by the industry which results in the discrediting of the study and the results of the same.

He further noted that the common catchphrase from people with regard to chemical contamination is the want of proof rather than assumptions. He stated that in order to find conclusive proof direct observational case control studies on human cells and tissues are required along with DNA functional assessment and mutation analysis. He also shared snippets of an ongoing research being conducted in this field and stated that the results are expected in 2021.

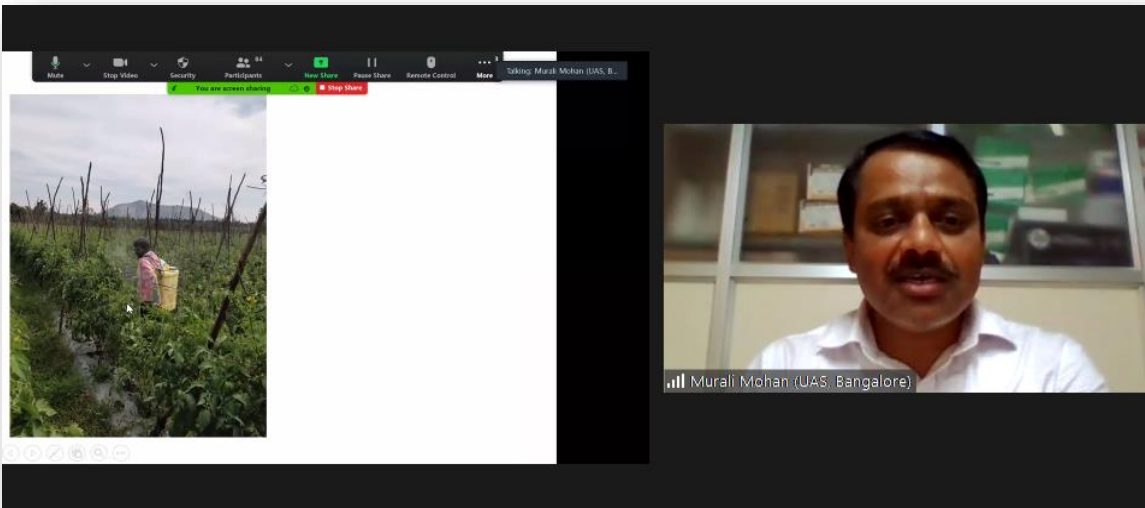
Dr. Rau summarized his address by putting forth key pointers that need to be followed to overcome the ill effects of chemical contamination. They are as follows:

- Assessing the problem
- Identifying the suspects
- Collecting accurate data and eliminating compounding and contributory factors
- Establishing the cause v. effect scenario conclusively
- Taking requisite administrative action
- Raising awareness with regard to chemical contamination

USE OF HAZARDOUS PESTICIDES IN AGRICULTURE -SUSTAINABLE ALTERNATIVES

Dr. Murali Mohan, Associate Professor, Department of Entomology, College of Agriculture UAS, GKVK started the presentation by emphasising on the vast and the diverse yields of crops that are being cultivated in the sub-continent. While this is helping the country to be self-reliant with respect to food, the use of pesticides and other chemicals is also rampant. The diversity of crops also requires a huge variety of chemicals, pesticides, insecticide and fungicides for better yield. Dr. Mohan went on to discuss the different types of inhibitions which are needed in the use of chemicals in the country. Pests, weeds, insects, diseases, caused devastating loss to the farmers and

mandated the use of pesticides and other chemicals to ensure that crop growth and harvest are beneficial to ensure self-reliance. The quick results and high yield were one of the encouraging factors for excessive use of chemicals. But, use of pesticides and other chemicals was not being looked at as an instrument to improve crop production but was rather rampantly used without understanding what the necessary requirements for healthy crops were. Dr. Mohan also discussed the data available with respect to pesticide use. The weeds standing at 37%, insects at 29%, diseases to the crops at 22% and other aspects which also included pests stood at 12%. But he noted that this data is being overlooked by farmers, and the rampant use of pesticides has affected and raised the toxicity level of the soil, to unprecedented levels. He also mentioned that at one point of time, the level of pesticide use rose up to 148% from the optimal percentage that was much lower than the used levels.



Thereafter, he discussed the classification of pesticides made by the World Health Organization namely, Class I which is subdivided into Class IA, IB followed by Class II, III and IV. Each classification included a type of pesticide which was thoughtfully classified based on the Lethal Dose₅₀ or LD₅₀ quantity, which talks about the amount of dosage which would be used in the farms, the higher the dose, the lower the toxicity of the chemical vice versa. He went on to talk about how the ban of extremely hazardous pesticides in India is of paramount importance. In India alone, 55% use of pesticides was very alarming. The spill over effect of the pesticides has slowly made its way to the food chain.

The unregulated use of the pesticides without any safety gears, the application of huge quantities of pesticides, unregulated and unnecessary mixing of different types of chemicals together and many other similar activities are being conducted by farmers. Dr. Mohan went on to talk about his personal experience on the field with similar sightings. In a number of cases, the use of unregistered chemicals was noticed in the course of the field visits. He spoke about the country's efforts at stopping the use of HHP's or Highly Hazardous Pesticides as suggested by the WHO and the country's efforts at looking for alternatives with respect to substitutes that could benefit the farmers

with better yield. He stressed on the need for classifying registered and tested pesticides by the Government and the measures that should be adopted to stop the use of cheap harmful pesticides. One of the most important points highlighted by Dr. Mohan was with regard to the Pre Harvest Interval (PHI) which is not being practiced by the famers. PHI is the amount of time which has to be given as an interval from the date of application of pesticides in the farm prior to harvesting the crops.

In the final leg of the presentation Dr. Mohan spoke about the sustainable methods which should be adopted by farmers. He advocated the use of bio-control agents, green chemistry methods which benefit the farmers by providing a sustainable alternative to reduce the spill over effect of hazardous chemicals to the food that we consume. The use of synthetic chemicals not only causes harm to human health, but also damages the environment. He also spoke about the need for undertaking awareness generating programs to educate the farmers on the use of safety and protective gears, procedure for application and controlled consumption of the chemicals. Lastly, Dr. Mohan spoke about the pilot project that he helped devise for assisting farmers to diagnose any disease or damage to the crops. The interface which has an inventory of a number of such scenarios would help to assist famers to get to the root level of the problem and ensure that they enjoy the benefits from the harvest.

PERSISTENT EFFECT OF PESTICIDES ON BIODIVERSITY AND ECOSYSTEM FUNCTIONING

Dr. Kanchan Kumari, Senior Scientist, CSIR-NEERI, Kolkata Zonal Centre commenced her presentation by explaining the impact of persistent pesticides on human beings, the environment and animals' health. She described that the impact began in the late 18th and 19th century which were marked by revolutions in two sectors, namely, industrial and agricultural sectors. She illustrated that when both sectors expanded there was a drastic increase in the use of chemical pesticides, particularly DDT (Dichloro-diphenyl-trichloroethane). The production of DDT has increased drastically and recently in the last year India has stopped the production of Dicofol, which is produced from DDT.

Dr. Kanchan further explained the impact of chemicals such as DDT. She elucidated that such chemicals have a persisting nature. She shared statistics of DDT impact on health and particularly mentioned the ill effect on mother's milk. She stated that naturalists in the 1950s have shown thinning of egg shells and crashing populations of bald eagles and other birds as a direct consequence of DDT poisoning. She went on to explain the characteristic features of Persistent Organic Pollutants (POPs) most of which are pesticides and synthetic organic chemicals. Their persistent properties are - they do not easily and naturally degrade; they persist in the environment for a long period of time compared to other chemicals and are global movers that is they have the property of long-range transport. They are also lipophilic, that is they accumulate in our fat.



Dr. Kumari described that the Stockholm Convention, 2001 (effective from 2004) banned such pollutants. Initially there were 12 Chemicals named as the 'dirty dozen' categorized as POPs and another group of chemicals was added later, six of which were pesticides. Dr.

Kumari mentioned that the Stockholm Convention in 2019 banned the production of Dicofol. She further explained that when POPs enter the environment through water, air or soil, they enter the body of living beings, plants or animals and bioaccumulation results. They pass into the food chains and accumulate in water bodies through run-off from the surface.

Dr. Kumari then explained the effects of POPs. She claimed that it was a 'Silent War' as the impact of POPs are not evident within days, but takes years to emerge. She listed out the major impact of these chemicals which are as follows:

- Reproductive impairment and malformation which lead to species extinction.
- Alteration of the immune system of the species.
- Alteration in liver functioning and increased risk of tumors.

Dr. Kumari explained that POPs affect different species in a different manner such as:

- Mammals- The reproductive and immune systems are affected as seen in Baltic Seals.
- Birds- POPs cause eggshell thinning and embryo alteration.
- Reptiles- Reproductive failure and decline in population is the effect noticed.
- Fishes- Reproductive alteration.
- Snails – Masculinization and population decrease.

All of the above impacts of POPs ultimately cause a decrease in the population of the species.

Dr. Kumari further explained the impact of POPs on Migratory Birds. She explained that migratory birds require a certain weight to undertake the migratory journey. However, the exposure to POPs causes these birds to become anorexic and hence they fail to put on the necessary weight to undertake the migration and die in the course of the journey. Dr. Kumari related the incident that took place in 2014 in Michigan, United States. It was found that DDT poisoning had caused the death of many species of birds that were found dead in the yards. Another research study was in relation to Beluga Whales in the St. Lawrence River. The Beluga whales suffer from several kinds of cancer, twisted spines, skeletal disorders, ulcers and thyroid abnormalities. The effect of POPs

persisted in these whales even when the levels of POPs were reduced in the water. The young whales acquired the contaminants through their mother's milk.

Dr. Kumari also explained that POPs have also caused stunted development of reproductive organs and reproductive failure in the alligators in Florida's Lake Apopka. Research showed that alligator eggs collected had relatively high levels of a variety of contaminants, including toxaphene, dieldrin and DDT breakdown products DDE and DDD. Dr. Kumari shed light on the abnormalities observed in Arctic Marine Mammals due to exposure to contaminants. Dr. Kumari further explained the effect of chemicals like Endosulfan and Organochlorine Pesticide on Amphibians. She stated that amphibians have survived many disasters but the exposure to such chemicals is causing limb deformations, delayed metamorphosis, immunosuppression, hermaphroditism, sex reversal and outright mortality in them. She also shared a news article that showed the destruction of biodiversity in Kasaragod village, Kerala, India.

Dr. Kumari then described the international regime for chemical regulation. She stated that different nations have included screening and prohibiting procedures to regulate such chemicals. The United States has the Environment Protection Agency as the agency for regulation and the United Kingdom has REACH as the regulatory agency. Thus, different nations all throughout the World have adopted different criteria apart from the one prescribed by the Stockholm Convention to regulate such chemicals. The European Union has banned these chemicals.

Dr. Kumari, further explained the Indian scenario with respect to chemical regulation and stated that India has ratified the Stockholm Convention in 2006 and also implemented the National Implementation Plan in 2011. This plan gives information about the persistent organic pollutants. She stated that India has been active in promoting non-POP alternatives to reduce the intentional and unintentional emission of POPs. The manufacture, use and import of most of the pesticides in India is banned under the Insecticides Act, 1968 and Insecticide Rules, 2011. Dr. Kumari also shed light on the legal status of POPs in India, wherein, the Ministry of Environment, Forests and Climate Change has notified the Regulation of Persistent Organic Pollutants (POPs) Rules, 2018 and has banned the manufacture, trade, use, import and export of the seven toxic chemicals listed under the Stockholm Convention. Dr. Kumari also provided the statistics related to NEERI's Contribution in the National Implementation Plan, 2011. Dr. Kumari concluded her address by emphasizing that all our actions impact biodiversity. She stated that the effects of our actions are seen as floods and landslides as seen in Kerala recently. She observed that the biodiversity cannot be exploited for our benefit. Dr. Kumari wound up her address quoting, "A road can be repaired but a species that goes extinct is lost forever."

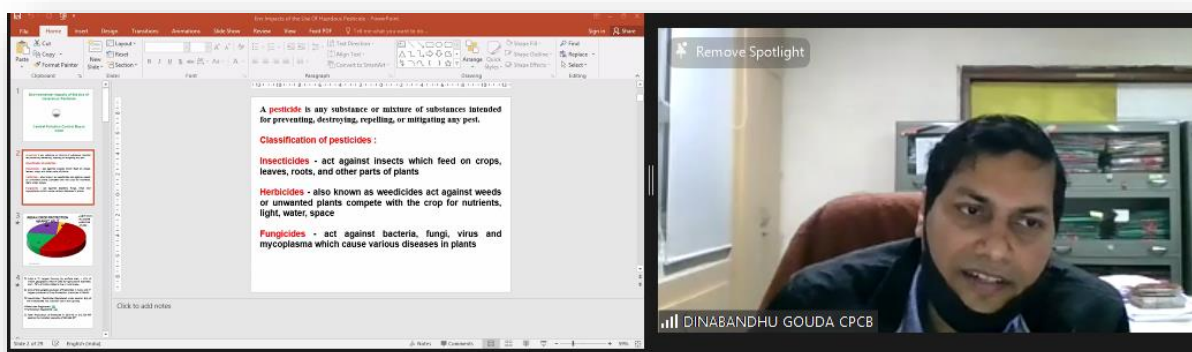
SESSION 5

The last session of the day had three speakers to deliberate on the impact of the use of pesticides on the environment, Mr. Dinabandhu Gouda, Additional Director & Head, IPC-I Division, CPCB; Mr.

G. Rambabu, Scientist, Central Pollution Control Board, and Prof. (Dr.) Nuzhat Parveen Khan Dean, School of Law, Bennett University. The session was moderated by Prof. (Dr.) Sairam Bhat.

ENVIRONMENTAL IMPACT OF THE USE OF HAZARDOUS PESTICIDES

Mr. Dinabandhu Gouda, Additional Director & Head, IPC-I Division, CPCB and **Mr. G. Rambabu**, Scientist, Central Pollution Control Board jointly deliberated on the topic of ‘Environmental Impact of the use of Hazardous Pesticides’ and gave the perspective of the Central Pollution Control Board in dealing with the matter.



Mr. Gouda emphasized on the point that the pesticide industry is one of the 17 highly polluting industries. Further, India is the largest producer of pesticide in Asia, and the 4th largest in the world. Pesticides account for as high as 82% of the Indian crop protection market split between 295 pesticides registered and 750 formulation registration. The total production of pesticide in India in 2018-2019 was 2,16,700MT against the installation capacity of 3,25,000MT.

After making the basic conceptual understanding about what is pesticide and the classification of pesticide into insecticide, herbicide and fungicide, Mr. Gouda explained the composition of chemical pesticides. He explained that Organophosphate pesticides, was developed during the early 19th century, but their effects on insects, which are similar to their effects on human, were discovered in 1932. Some are very poisonous. However, they are usually are not persistent in the environment. Next was Carbamate Pesticides, followed by Organochlorine Insecticides, which was commonly used in the past, but many have been removed from the market due to their health and environmental effects and their persistence (e.g., DDT and chlordane) and Pyrethroid Pesticide, developed as a synthetic version of the naturally occurring pesticide pyrethrin. Some synthetic pyrethroids are toxic to the nervous system.

Mr. Gouda, then, discussed the common methods used in the manufacture of pesticides, being, chemical synthesis and the process of formulation. Most pesticides today are produced by chemical synthesis. In a typical manufacturing plant, one or more batch reactor vessels is used in a series of reaction, separation and purification steps to make the desired end product. Numerous types of

chemical reactions, recovery processes, and chemicals are employed in order to produce a wide variety of chemicals, each conforming to its own rigid product specification. The Pathway of Pesticide Movement was discussed by Mr. Gouda who emphasised on the point that some pesticides are persistent organic pollutants that are carbon-based compounds that remain intact in the environment for a long time; become widely distributed throughout the environment, accumulate in fatty tissue of living organisms; and are toxic to humans. To support his claim, he relied on the IARC Classification where the pesticides are divided into 5 groups depending upon its harmful effects.

Group 1	Carcinogenic to humans	109 agents
Group 2A	Probably carcinogenic to humans	65 agents
Group 2B	Possibly carcinogenic to humans	275 agents
Group 3	Not classifiable as to its carcinogenicity to humans	503 agents
Group 4	Probably not carcinogenic to humans	1 agent

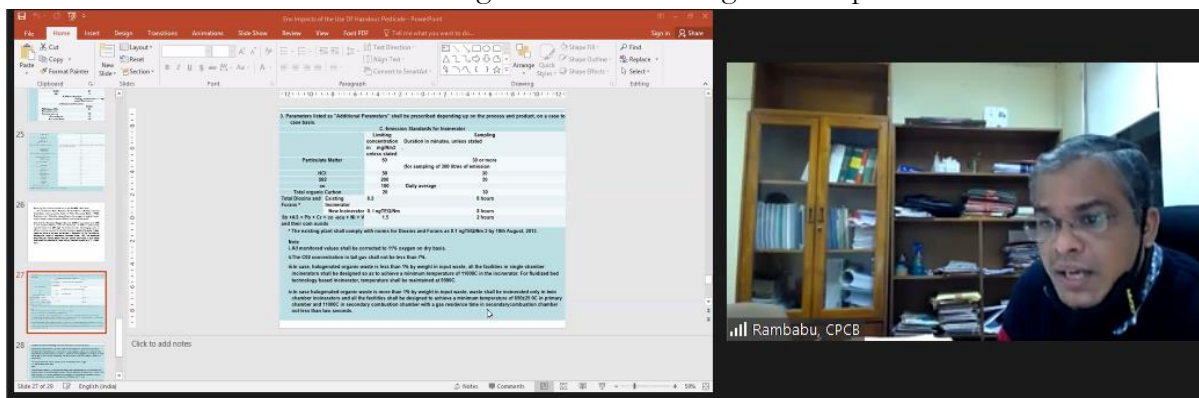
It can be observed there is only 1 agent in the non-carcinogenic group (Group 4 category) which makes the situation very desperate and to deal with this, he regarded Stockholm as a great tool. He emphasised on the Objectives of Stockholm Convention and Article 1, which protects human health and the environment from persistent organic pollutants (POPs), and provides for the elimination of production and use of intentionally produced POPS, minimization of unintentionally produced POPS. Furthermore, Article 3 of the Convention talks about elimination of intentionally produced POPS. The list in Annex A has chemicals whose production and use are prohibited like Aldrin, Chlordane, Dieldrin, Endrin, Heptachlor, hexachlorobenzene, mirex, PCBs, and toxaphene. The restricted list includes DDT (production restricted in Annex B). Annex C includes unintentional production list having PCDD/PCDF. Mr. Gouda then turned the attention of the participants towards the preparation of National Implementation Plan. He explained that at the stage of NIP preparation stage, the ground level situation of all 12 POPs is assessed through proper inventorization, sample collection, analysis and interpretation. For the development of NIP, the MoEF&CC worked closely with Central Pollution Control Board (CPCB), Ministry of Agriculture (MOA), Ministry of Chemicals and Fertilizers (MOCF) Department of Chemical and Petrochemical, Ministry of Power and Ministry of Health and Family Welfare (MoH&FW).

The Action Plan of NIP includes environmentally Sound Management and Disposal of PCBs, development and promotion of non-POP alternatives to DDT, implementation of the Best Available Technology (BAT), elimination reduction of unintentional POPS emissions of the priority industry sectors, preventing release of Dioxins and Furans due to burning, production and promotion of bio-botanical neem derived bio-pesticides as viable, eco-friendly, bio-degradable alternatives to POPs pesticide, identification of sites contaminated by POPs chemicals and of remediation process at the potential hotspots , inventorization of newly listed POPS, monitoring of national POPs through a program and lastly, strengthening institutions and capacity building for effective and efficient implementation of the NIP in India.

Mr. Gouda explained how CPCB is working to achieve these objectives, by making, various facilities available at CPCB TOC Laboratory. The development of National Reference Trace Organics laboratory at CPCB in collaboration with Indo-German Bilateral Programme is the first step in that direction. The laboratory is first of its kind in India and has State of the Art facilities and International Standards infrastructure facilities for Trace Organics Analysis in various Environmental matrices. CPCB is monitoring sample by using USEPA Method no 80818, 2007. At present out of 12 POPs only 9 are measured at CPCB except Endrine, Toxaphene, Mirex. Similarly, out of 16 new POPs only 5 are measured (which are Alpha HCH Beta HCH, Lindane, Pentachlorobenzene and Endosulfan).He further informed that MoA banned on Billrex and HCB in March 27,2014 and Lindane in March 2011. MoEF& CC notified 7 chemicals out of 16 new POPs as for prohibition on manufacturer vide 29.08.2017. Cabinet has also ratified a ban on seven chemicals that are hazardous to health & environment listed under Stockholm Convention on October 07,2020, which are-Chlordecone; Hexabromobiphenyl; Hexabromocyclododecane; Hexabromodiphenyl ether and heptabromodiphenyl ether; Hexachlorobutadiene; Tetrabromodiphenyl ether and pentabromodiphenyl ether and Pentachlorobenzene

He further mentioned that MOEF&CC has notified vide letter dated 06.04.2016 for regulation and prohibition of use of by 31.12 2025.Lastly, Mr. Gouda concluded by informing the participants about the future plans on the issue which include upgradation of national implementation plans (NIP 2011), financial resources required to strengthen infrastructure facilities of CPCB and RD Laboratory, strengthening of SPCBs Laboratories where POPS chemical industries are largely located particularly Gujarat, Maharashtra, Telangana, increasing awareness among SPCBs on POPS. Further, CPCB has been nominated as executing agency for the Project on ‘Development and Promotion of non-POPS alternatives to DDT’. Mr. Gouda also stated that the CPCB is working in close collaboration with UNP to develop ‘bio pesticide’ as an alternative to chemical pesticide.

Mr. Rambabu, gave brief remarks on the practical aspects of dealing with contamination sites from his practical experience. Mr. Rambabu discussed that while examining the impact of illegal discharge and contamination, less emphasis is made on contamination of groundwater. The detailed study into the extent of contamination of soil because of the use of pesticides takes about 1 to 2 years. He expressed his concerns on the absence of any standards for soil contamination and emphasised the need to build a robust mechanism for groundwater investigation for pesticide contamination.



ENVIRONMENTAL DEGRADATION AND PESTICIDES

Prof. (Dr.) Nuzhat Parveen Khan, the Dean of School of Law, Bennett University, Greater Noida, spoke on the topic Environmental Degradation and Pesticides. She commenced her session by explaining the various factors that affect the environment that can be either natural or man-made. The latter is more abundant and is responsible for polluting all three essential components of the environment at the same time, i.e., soil, water and air. She further explained that the right to clean and healthy environment tantamount to the right to health and the right to life which needs to be protected under all circumstances. The role of the state is to regulate and limit the actions of the stakeholders which are detrimental to the environment and its well-being and so that what degrades the environment can be dealt with. This is quite common to the universally accepted concept of Sustainable Development.



Dr. Khan covered three important aspects- first, the various hazards that are involved in the process of manufacturing to the ultimate use of pesticides and the consequent environmental degradation, second, the legal control and regulation of pesticides, the existing laws and the prospective law - the Pesticide Management Bill, 2020 and third, what measures can be taken to avoid or at least mitigate environmental degradation which is caused by pesticides and the alternatives that can be adopted to replace harmful pesticides. They are explained as follows:

- 1. Hazards involved in the process of manufacturing to the ultimate use of pesticides and its environmental consequences:**
 - The use of pesticides has increased manifold over the past few decades all around the world and not only India. Nowadays, it is not restricted to only the agricultural fields but are

employed in homes as well in the form of sprays, poisons and powders to control cockroaches, mosquitos, etc.

- Although pesticides are used for specific purposes they are also very harmful for humans and the environment. On one hand, the use of pesticides has increased agricultural production but on the other hand, it has also increased vector borne diseases and has resulted in serious health implications with several side effects to the environment.
- A disproportionate burden is shouldered by the people of developing countries mostly affecting high-risk groups of each country and therefore, underdeveloped countries and developing countries are more prone to its ill-effects as compared to other developed countries.
- Pesticides are further carried by groundwater, rivers and rainwater. Pesticides also result in residual problems which has been defined by WHO as ‘any substance or mixture of substances in the food of either humans or animals that is caused by the use of pesticides and any specified derivatives such as degradation and conversion products, reaction products, metabolic and impurities that are considered toxic.’

2. Legal control and regulation of pesticides:

- The regulation of pesticides through legislation consists of certain significant laws such as the Insecticides Act, 1968, the Insecticides Rules of 1971 and the prospective law of the Pesticides Management Bill, 2020 which if passed would replace the Insecticides Act.
- The registration process has to be undergone for all pesticides and insecticides which are listed in the schedule of the Insecticides Act and the registration certificate mandates the requirements for packaging which clearly indicates the nature of the insecticide - whether it is for agriculture use or household use, its composition, active ingredient, caution signs, safety precautions. The pesticides for agriculture should not be used in households but precautionary labelling is generally missing and these pesticides are also used in kitchen gardens. This raises questions about implementation of provisions and their monitoring of laws.
- Keeping in view the risks involved to the present and future generations, awareness has to be imparted to the stakeholders at lowest strata such as retailers and farmers but it is not sufficiently carried out
- The law has provisions for punishment for manufacturing and importing without a licence or certificate. Punishments can go up to two years as well as fines which may be up to ten thousand rupees extending up to fifty thousand rupees. The prospective Pesticides Bill can increase the punishment which may be up to three years but the increase in fine is only slightly higher.
- Banning and restricting the use of pesticides in India include provisions such as the periodical scrutiny and review by the Central Insecticide Board and Registration Committee on pesticides and their uses. Pesticides can be banned even after registration if it causes serious environmental and public health concerns. They are meant for restricted use only which means they can be used only for prescribed purposes by the authorised person by obtaining the appropriate government licence. Various loopholes exist in this domain as the

Indian laws are lagging behind on many fronts. For example, under the Pesticide (Prohibition) Order of 2018 issued by the Central Government, 18 pesticides have been banned although the expert committee that have recommended pesticides to be banned had reviewed a total of 66 chemicals several of which feature under the Rotterdam Convention.

- The safe use of pesticides cannot be expected under this approach because farmers are not properly informed or trained on how to use pesticides. Furthermore, they are neither aware nor have access to Personal Protective Equipment (PPE) kits, thereby putting themselves in danger and they ignore all precautionary measures giving rise to indiscriminate and illegal practices.
- India has ratified the Rotterdam Convention which consequently has authorised Ministries to perform the role of national authorities by listing pesticides and chemicals in the Convention which will aid in arriving at informed decisions of permitting imports. For example, the Pesticide Action Network has ordered the US Government to think of listing certain chemicals which are being provided in quantities in excess of the benchmark set under this Convention which would in turn facilitate the process of sharing the information in international trade as well.

3. Suggestion to avoid and mitigate environmental degradation and alternatives for the use of pesticides:

- India is the fourth largest producer of pesticides in the world. The Pesticide Management Bill, 2020 should be seen as an opportunity to set right many shortcomings of the existing regulatory regime around pesticides in India.
- The Draft Bill has many shortcomings which need to be rectified before it is enacted. Firstly, its Preamble should very clearly talk about protecting human health and environment from the risk posed by pesticides and all regulators should also be clear about their responsibilities with the sole objective of protection and safety as a reason for legislative promotion.
- The appointments which are generally made under the law should clearly specify that the members of bodies should have some independence and should be completely devoid of any conflict of interest with pesticides industries.
- The provisions related to registration should clearly include the need for an alternative assessment before a pesticide registration application is processed so that more alternatives can be used instead of chemicals.
- The registration procedure should lay down some terms and conditions such as the specification by the applicant whether a particular pesticide has been banned or severely restricted in other countries wherein such chemicals should not be registered in India. For example, the WHO has laid down Class I and Class II pesticides which should not be registered if attempted for.
- Registrations applied for pesticides should automatically come under review after certain duration of time. Additionally, a separate review committee should be set up under the Act consisting only of some people who are experts in bio-safety separate from the registration committee.

- Registrations should be based on long terms, independent and transparent bio safety assessment without any conflict of interest. Such assessments should not be based on only the active ingredient but should also include inert substances that go into the formulation of pesticides.
- Furthermore, the state governments should be empowered to prohibit the manufacturing or use of pesticides in their jurisdiction.
- Penalties for contravention of the Act should be more deterrent. For example, there is no separate punishment for more adverse acts such as aerial spraying of pesticides with the use of drones which is being carried out by numerous entities.

Prof. Khan concluded by stating that the pesticide industry should be brought under a regulatory regime that regulates the product cycle which should include within its ambit the provisions for disposal. This regime should also cover the advertising and aggressive marketing of pesticides.

This session was followed by discussions and concluding remarks by **Prof. (Dr.) Sairam Bhat**. One of the questions raised was whether the incentives of the Pesticides Bill, 2020 to farmers to resort to organic farming would lead to the decrease in the rampant use of chemical pesticides? In answering this question, Prof. Bhat stated that productivity and income is a challenge and a grave issue because today agricultural fields are infected by pests and there are further challenges in terms of fungicides and weedicides which would continue to exist even in the near future. Farms with lower yields belonging to low-income families cannot in reality afford organic farming. However, corporate farming should be encouraged along with increase in big land holdings to make a move towards organic farming with the farmers in India. He gave the example of cotton farming and noted that a large amount of pesticides is used in cotton farms which in turn enter the food chain as the cotton seeds are given to the cattle thereby transferring pesticides to the cow milk and the animal and human food chain. On the contrary, cotton farmers insist on the use of pesticides as it has become a necessity for them. If the government can encourage and incentivize organic farming, it will be a step forward and the right effort would also be to develop organic pesticides such as Neem coated Urea.

Prof. Nuzhat also shared her views stating that most of the farmers and small landholders are interested in getting more yield out of farming. In the process, the crops and grains have lost their taste and quality along with the varieties available in the market. Similarly, these pesticides and insecticides are altogether different from what was being produced years ago. However, small farmers want more yield as they have to survive on their own. Hence, they use whatever is available without thinking that it will affect their health or the next crop. Prof. Sairam concluded by stating that even if neighbours start using pesticides, it results in transboundary transfer. For example, pesticides used in horticulture can be spread by honeybees. Prof. Nuzhat further added that there is an imminent need to come up with some alternatives which should not only be sustainable but suitable as well. The session ended by delivering a vote of thanks to the resource persons and participants and the sharing of the feedback form with the participants. This was followed by the paper presentations which were parallelly held in two breakout rooms.



PAPER PRESENTATIONS – PARALLEL SESSION 1

Parallel Session 1 of the paper presentations was chaired by **Prof. (Dr.) Bismi Gopalakrishnan**, Dean, Faculty of Law, Head, School of Indian Legal Thought, Mahatma Gandhi University, Kottayam. Six papers were presented in this session and the abstracts of the papers have been presented below:

1. **Arsenic Build Up in Soil, Crops, Vegetables- A Study (Based on Parliamentary Committee Reports) -Dr. R. Anthony Raj**

Modernisation of agriculture has led to greater dependence on various agro-chemicals, especially pesticides which are highly hazardous. Nearly Rs. 25,000 crores worth of agricultural produce are lost due to pests, diseases, weeds, post-harvest spoilage etc. To protect plants from these pests, farmers normally use toxic chemicals, known as pesticides, which are highly hazardous in nature. The past 30 years of chemicalisation of agriculture has become a severe threat to plants, animals, human life and the fragile environment around the world. Approximately 3 million people are taken ill every year due to pesticide poisoning and upto 20,000 of them die in agony (WHO estimate). Arsenic build up is also a matter of concern which is prevalent in the groundwater in 12 states covering 96 districts and impacting adversely the life and livelihood of 70 million people for a long time. According to the finding of ICAR, more than 90 percent of the total ground water in Arsenic affected areas is used for irrigating crops. Many investigators considered water-soil-crop-food transfer, cooking water and direct ingestion of arsenic contaminated water as the major exposure pathways of arsenic. The food crops sold off to inhabitants of uncontaminated regions lead to their

consumption of arsenic contaminated food. The high Arsenic content, the causes, the effects and also the efforts of the government to alleviate the people from its evils is discussed in this paper mainly with the help of parliamentary committee reports of the Lok Sabha.

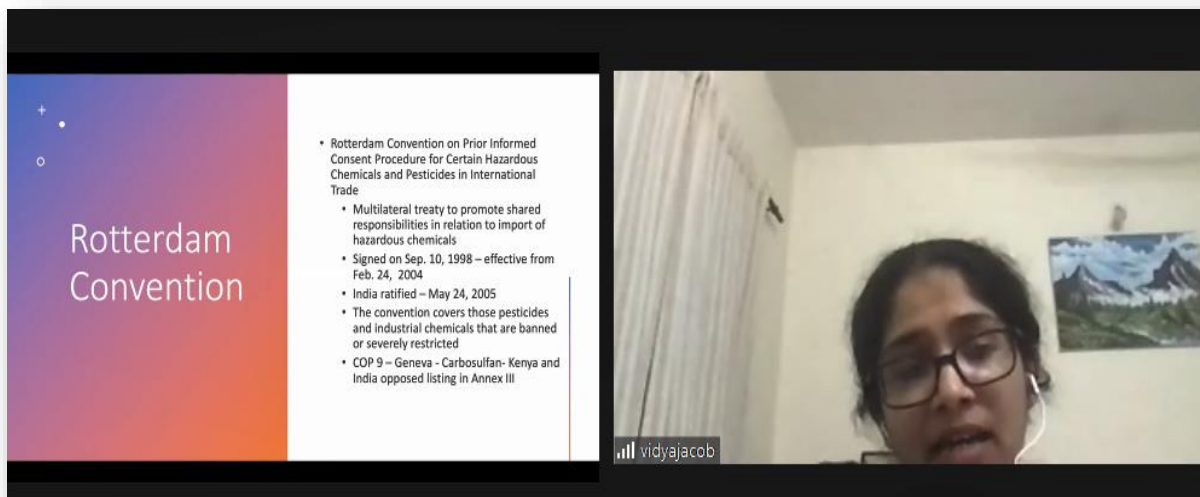
2. Using of Pesticides and Environmental Degradation and violation of Human Right to life – A Study - Dr. Susmita Dhar

Environment is our surrounding. Right to life with dignity in this beautiful habitat is our birth right as Human being. Human Right to life in free and fair environment is a fundamental, universal, inalienable Human Right which should be protected to maintain sustainability. Not only Human life is precious but also the existence Flora and Fauna is essential to protect Biodiversity. We the Human being want food, clothing, shelter, education, economy, social and cultural rights, health, unpolluted air, free Environment and strong health to survive. So right to Environment is prerequisite of Right to life which is violated by using of hazardous pesticides in Agriculture. Pesticides are chemicals use to finish fungal or pests in crops. Using of pesticides harm Environment in various way. Wind carries them, soil absorbs them, rain water washed out them to another site which can cause Bio diversity Loss and destroying of food chain, hampering plants growth, objected nitrogen fixation in soil. The ultimate result is violation of Human Right to life in free and fair Environment. The use of pesticides is increasing from 1999 to present time which directly hampers public health. According to scientists the absorption of pesticides into the soil causing declining growth of beneficial microorganisms, pesticides are now present in fog, water, snow, air which has a deleterious effect on Human health. The Rotterdam convention adopted by the UN in 1998 which was came into force in 2004 having 161 parties still working towards promoting and sharing the responsibility and cooperative efforts among the parties regarding the use of hazardous chemical to protect Human Health and Environment. Sustainable agriculture, Ecological Farming, organic farming, use of genetically modified seeds are the alternatives which can reduce the use of pesticides and protect humanity. India ratified Rotterdam convention though it is largest manufacturer of pesticide.

3. Regulating Pesticides in India vis-a-vis Human Health and Environment: An Analysis – Ms. Renukha Joseph and Ms. Vidya Ann Jacob

Being the fourth largest producer of pesticides internationally, India has a market for production and usage of insecticides for farming practice. Over the past decades, due to ineffective regulation of pesticide usage by farmers, farm workers and animals have been exposed to the toxic effects of pesticides. In 2011, a large number of people in Kerala were victims to the harmful effects of a widely banned pesticide called endosulfan. The Supreme Court issued directions to ban the usage and manufacturing of endosulfan in Kerala. At the international level, the Rotterdam Convention on chemical management introduced in 1998 was an effort by countries to regulate international trade of certain hazardous chemicals. The convention came into force in 2004 and India ratified the convention in 2005. India has been inconsistent with implementing laws governing certain harmful chemicals. The noncompliance measures at the local and state levels, have caused adverse health

hazardous to people and wildlife and hence calls for an immediate recourse. The insecticide Act 1968 has been the main regulatory regime in India. It does not encompass a sustainable approach in ensuring protection of human health and biodiversity. This article examines the regulatory challenges, India faces in phasing out the pesticide. The research also explores the scope of introducing the Pesticide Management Bill 2020, and the extent to which the bill will protect human health and environment. There is a need to enhance the regulatory regime with regard to production and usage of pesticides at national and state levels to prevent another endosulfan tragedy in India.



4. The Hazardous Impact of Pesticides and Insecticides on Environment with Reference to Sustainable Development- A Suggestive Approach - Mr. Md. EnamFirdos

The environment is affected by various factors, natural and manmade. Here I am concerned with one such important pollutant which is manmade in nature and is responsible to pollute all the three essential components of environment at the same time viz. soil, water and air. The hazardous impact of pesticides and insecticides on environment and human health is well known. The pesticides pollute the ground water, rivers and seas when carried by rain water to those channels. It pollutes the soil as well and reduces the fertility and develops a kind of resistance in insects and pests which results in more use of those pesticides. Here in this paper I would like analyze hazardous impact of pesticides and insecticides on environment and human health in the light of existing regulations in tandem with international standards and the prospective legislation i.e. the Pesticides Management Bill, 2020. I would also like draw the attention towards sustainable development while regulating the use of reasonable use pesticides and insecticides or finding out alternatives to the same. I would also substantiate that The Insecticides Act, 1968 and Insecticides Rules, 1971 regulate the import, registration process, manufacture, sale, transport, distribution and use of insecticides (pesticides) with a view to prevent risk to human beings or animals and for all connected matters, throughout India. But there is no specific regulation regarding the regulation of the conduct of farmers so that

use of pesticides and insecticides can be minimized as they think more use of these chemicals will yield them more and cycle continues resulting into over use and unregulated use of those hazardous chemicals. I think there is need of regulation coupled with sensitization and specific awareness about the same must be tendered to the actual and prospective users of those chemicals respecting sustainable development goals.

5. Comparison between Indian and International Standards of Pesticide Management -
Ms. Deiya Goswami and Ms. Akalya Ravichandran

Soon after Green Revolution, the government bodies, international organizations etc felt the need to switch to non-chemical based pesticides as the injudicious use of chemical pesticides has resulted in several adverse effects on ecology, health and wellbeing of the related parties, on soil and water bodies etc. The present article analyses the scope of Pesticide management bill and is scrutinized initiative of the Ministry of Agriculture & Farmers Welfare, Department of Agriculture, Co-operation & Farmers Welfare (DAC&FW) under the ongoing Strengthening and Modernization of Pest Management Approach in India (SMPMA) scheme under the Integrated Pest Management (IPM) system. Further the Author(s) aim to compare with the new bill with the International Code of Conduct on Pesticide Management and in conclusion the author(s) would submit certain suggestion in order to tackle the mismanagement of pesticides in India and finally to achieve the Sustainable Goal of 2030 well within the timeframe. Keywords: Pesticides, Green Revolution, Strengthening and Modernization of Pest Management Approach in India (SMPMA), Integrated Pest Management (IPM), Sustainable Development Goals.

6. Harmful Implications of The Use of Pesticides-Case Study of Endosulfan Tragedy in Kerala-
Ms. Saranya Unni R

Indian economy is considered to be agrarian. Agriculture is the main source for raw materials for production and for the other crops for consumption. As the Indian economy is agrarian, the nation is heavily dependent on the agricultural sector. In order to cater the food requirements of a huge population, with the limited amount of cultivable land, usage of pesticides was a solution. Pesticide usage started in India in 1948. During the years of 1954-2000 the use of pesticides had tremendously increased. The pesticide usage had considerably increased because of green revolution. India being a country where 65 % of the workforce is dependent on agriculture, they are hence exposed to the use of the pesticides which are harmful. Pesticides can not only harm the environment but can cause the health hazards including cancer. India has witnessed a number of pesticide tragedies till now. The pesticide tragedy in Kerala that happened by the use of insecticide called endosulfan is the one that has left harmful health impacts on people. Congenital birth defects, loss of immunity, reproductive health problems, cancer were the after effects of the insecticide. This paper aims to study the harmful implications of the use of pesticides with the help of the case study of endosulfan in Kerala.

PAPER PRESENTATIONS – PARALLEL SESSION 2

Prof. Dr. Sairam Bhat, Professor of Law, NLSIU was the chairperson of Parallel Session 2 of the paper presentations. He was joined by Ms. Lianne D'Souza and Ms. Geethanjali K.V. in providing feedback to the presenters. Six papers were presented in this session and the abstracts of the papers have been presented below:

1. **Implications of Pesticides on Human Health-** *Koblica Nag*

Pesticides are used in order to protect plants from certain types of insects or pests which may cause damage to the plant. They are considered to be a boon for the farmers as it contributes towards the advantageous protection of their crops. Apart from this pesticides also have an adverse implication on the health of human beings. This paper aims to discuss how pesticides affect the health of human beings. We shall focus on the disadvantages of pesticides with reference to health, which makes it a bane. Pesticides can cause temporary unfavourable health effects, referred to as acute effects, as well as chronic health effects that can manifest months or years after exposure. Examples of acute health effects consist of stinging eyes, rashes, blisters, blindness, nausea, dizziness, diarrhea and death. Examples of chronic health effects are cancers, delivery defects, reproductive harm, neurological and developmental toxicity, immunotoxicity, and disruption of the endocrine system. Some human beings are extra susceptible than others to pesticide impacts. Infants and youngsters are recognized to be extra prone than adults to the poisonous outcomes of pesticides. Farm workers and pesticide applicators are additionally prone due to larger exposures. Children are greater prone to pesticides publicity due to their organs, nervous system and immune structures are nonetheless developing; their greater rates of cell division and decrease physique weight additionally amplify children's susceptibility to pesticide and risks. Their immature organs and different growing organic structures are especially susceptible to poisonous contaminants. Exposure throughout positive early improvement durations can reason everlasting damage.

2. **Regulatory Framework for Manufacturing Pesticides in India-** *M. Balaji and Kotta Naga Anjaneya Chaitanya*

India is one of the developing countries where the main occupation is agriculture. Indian agriculture accounts 18 percentage of India's Gross Domestic Product (GDP) and more than half of population in India has either directly or indirectly with the Agricultural sector. In recent times many farmers in order to get high yield and pest free crops, are using fertilizers, pesticides and insecticides, which are not only harming the human body but also the environment and wildlife. India's regulatory framework that controls the use of pesticides and insecticides had banned many chemicals from time to time. The international treaties like World Trade Organization, Stockholm convention and Rotterdam Convention played an important role in the banning on chemical usage in pesticides and insecticides in India. In India the central pesticide boards and regulation committee which were established under the Insecticides Act, 1968 regulates and registers the usage of pesticides. Recently,

there was a proposition put forth by Parliament to replace the said act with Pesticides Management Bill, 2020. It seeks to regulate the manufacture, import, sale, storage, distribution, use, and disposal of pesticides, in order to ensure the availability of safe pesticides and minimize the risk to humans, animals, and environment. But, according to Crop care Federation of India and Bharat Krishak Samaj, Pesticides Management Bill of 2020 has few gaps within it and would hurt the farmers drastically. This paper would look into regulatory and legal framework of pesticides in India, with its special reference to the newly proposed bill and compares the same with International standard. The paper also refers the role of judiciary in agro-chemical issues and recommends few suggestions regarding the same.

3. **International Trade of Chemical and Pesticides** - *Ms. Priya Gupta*

This research study essential Present a primer on banned and unregistered pesticides that can cause severe environmental damage and therefore must be carefully regulated. Despite bans on certain pesticides and their replacement by others considered less hazardous, the widespread use of these substances in agriculture continues to threaten the health of millions of people. This paper discusses the current dual standard in the international trade of pesticides, analyzing the trends in foreign trade (imports and exports) of selected pesticides. For example, exports to Brazil of some pesticides banned in the United States and Europe. The dangers from improper use of pesticides in developing countries have major implications that extend beyond their own borders. The indiscriminate application of pesticides has contributed heavily to accelerating pest resistance, a phenomenon that threatens food production. This paper will also present the problems of pesticide use and what new policy would be enacted that will include expansion of labeling requirements for exported pesticides, controlling export of banned and unregistered trade, promoting cooperation with International Organizations, and promoting the development of regulatory framework with developing countries. This paper will also present how International trade of pesticides has become increasingly more complex making more difficult to track cases of classic dual standard. The research will also talk about the key stakeholders and victims in the illegal pesticides trade that is the framers who intentionally or unintentionally purchase illicit plant protection products. At the global level total pesticides trade reached approximately 5.9 million tonnes in 2018, with a value of 37.6 billion in USD where as reported trade in hazardous pesticides was valued in 2018 at 357 million USD. The global trade of hazardous pesticides decreased substantially during the period 2007- 2008.

4. **Detrimental Effects of Pesticide Use in Urban Sphere** -*Mr. Som Dutt Vyas and Ms. Isha Mishra*

In the current era wherein urbanization is a well acceptable norm amongst the citizenry, the clear boundaries between urban and rural communities have blurred tremendously. Henceforth Rural issues are not primarily limited to Rural communities only but are part and parcel of Urban areas and metropolitan cities too. Henceforth it is the utmost devoir of concerned individuals to be aware of Predicaments faced by both Rural and Urban populace due to the ill effects manifested by excessive

use of pesticides. Many developing and developed countries such as Saudi Arabia, Cambodia, European Union have already banned the use of number of pesticides and are focusing on pesticide free agricultural practices. In furtherance to this brief introduction of pesticides affecting Urban Sphere, our paper will primarily deal with following aspects in research:-

- Urban areas at much more risk of pesticide toxicity due to denser population and much more income disparities resulting in gaping inequalities between ‘haves and have nots’ as compared to Rural areas.
- More levels of Pollution in Urban areas due to heavy industrialization to meet up with the never ending demands of individuals in various facets of life.
- Certain case studies which would help us reinforce our arguments regarding urban toxicity due to pesticides.
- Lack of waste management and lack of nuanced techniques to deal with waste materials generated from hefty production of pesticides.
- Lack of ethical values amongst profit devouring industrialists who only value for stock prices of their regime rather than Predicaments faced by individuals due to their over exploitative practices with respect to resources.
- Dumping of banned pesticides in developing or under developed countries by developed and thriving countries such as USA, U.K., EU, etc.
- Right to health compromised by excessive use of pesticides

In furtherance to the aforementioned bullet points, we would also research upon jurisprudential, constitutional, humanitarian and environmental aspects with respect to our topics. Lastly, being a part of legal fraternity, it is our duty to link health implications related to pesticides with the legal aspects such as provisions to protect individuals from pesticide toxicity, certain lacunas with respect to the current legal provisions.

5. **Environmental Degradation and Pesticides** - *Mr. Bodhiratan Bharte*

In the current riveting and contemporary era of effectively changing lifestyle and the use of various chemicals to maintain the comfort zone, it is obligatory to enlist certain crucial elements pertaining to the environmental regimen of earth. There is certainly a matter of dispute pertaining to current lifestyle and use of chemicals imbibing the environment degradation on facets. These disputes which range from being trifling matter to being that of much more incidental approach makes it is the devoir of utmost importance for legal fraternity to embark upon the certain mechanism to combat such Disputes. In commonplace people are worried about the environmental degradation but no one is taking necessary action against the persons which is responsible to make our globe a worse place sewage water is a most common problem as well as industrial wastage is also an very hazardous to an environment. Using of hazardous pesticides is also sprinkling a poisonous substance in our body and this situation is very common across the globe being a legal fraternity it is believed that there is a need of extensive research on such topic to make strict laws to save our planet. In furtherance to this one of the most ardent and paramount facet of law as a subject is to ensure rights of people and civility amongst the citizens as a whole, to maintain a peaceful and merrier society it is supremely important for all the of us i.e. human beings, birds , animals and every other creature to ensure a staunch and effective mechanism for combating against evils subsisting in society and related conundrums which can be resolved by nuanced policies rather than an archaic or any straightjacket reason of thought. Furthermore being a part of legal fraternity, and being a pupil of law which is a transcendental discourse of Day-to-Day life, it is my utmost and prime duty to divulge

my thoughts and to research in various aspects of the Legal picturesque relevant with Environmental policies . Henceforth in this paper, I would be dealing with one particular field, i.e. ‘Environmental degradation and pesticides from the vast arena of Environmental policies as a contemporary aspect in the legal fraternity.

6. Environmental Degradation and Pesticides - *Mr. Yatharth Chauhan*

Pesticides, chemical substance, serve as a tool to assassinate pests. This maneuver of pesticides is so ordinary that frequently the expression pesticides stand equivalent with products concerning the protection of the plant. It is basically used to set aside the agricultural pests that vandalize the crops as well as livestock which in turn severely affects the productivity of farm. Typically, insecticides, herbicides, Rodenticides and Fungicides are employed to kill pests namely Rodents, weeds, bird mites, insects, fungus, and so forth. When it comes to Public Health, Pesticides eventuate as an important mechanism to kill vector-borne disease say for instance Dengue, west Nile virus, Malaria, Lyme, etc. The growth and development of the Agricultural sector have weighed down the natural ecosystem. Most of the pesticides are, certainly, linked with health and the environment as well. The incongruous application of pesticides is detrimental to good health and a sustainable environment. The instant research paper discusses the historical aspect of Pesticides, their source, their classification, and most critically their negative impact on the environment, health, and aquatic ecosystem. Laws pertaining to regulation of pesticides in India have been detailed. It also discussed the violation of Human Rights regarding the inappropriate application of Pesticides.
