

**CONSTITUTING RISK: PESTICIDES, REGULATORY SCIENCE
AND FARMERS IN WESTERN UTTAR PRADESH**

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**DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES
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by

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Department of Humanities and Social Sciences

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CERTIFICATE

This is to certify that the thesis entitled, “**Constituting Risk: Pesticides, Regulatory Science and Farmers in Western Uttar Pradesh**” being submitted by **Abhigya** to the Department of Humanities and Social Sciences, Indian Institute of Technology Delhi, for the award of **Doctor of Philosophy**, is a record of the bonafide work carried by her under my supervision. In my opinion, the thesis has reached the standards of fulfilling the requirements for submission relating to the degree. The contents of the thesis have not been submitted in part or full, to any other university or institute for the award of any degree or diploma.



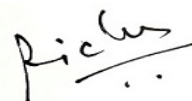
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“Thanks to the human heart by which we live,
Thanks to its tenderness, its joys, and its fears...” –
William Wordsworth, Ode: Intimations of Immortality from Recollections of Early Childhood

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Abhigya

A handwritten signature in blue ink that reads "Abhigya". The script is cursive and fluid, with the first letter 'A' being particularly large and stylized.

ABSTRACT

Pesticides, along with chemicals fertilisers and high-yielding variety of seeds, are considered to be indispensable inputs within productivist forms of agriculture. Concerns around the health and environmental effects of these chemicals are equally pervasive, however. In the past decades, the Insecticides Act, the statute undergirding the framework for regulating pesticide use in India, has been at the centre of public debates due to poisoning incidents among farm workers, rejection of export produce of Indian origin due to the presence of pesticide residues, as well as emerging studies on links between pesticides and chronic health issues.

This dissertation probes into how the framework of regulation of agricultural pesticides in India and dominant notions of risk, safety, causality and acceptable levels of pesticide exposure across a range of actors mutually constitute each other. It discusses the debates around the Insecticides Act and the Pesticide Ban Order 2020 between actors such as regulators, scientists – toxicologists, pesticide chemists, entomologists, and industry players – from generic and international companies, civil society organisations and farmers’ representatives. The debates bring out the overlap and contradictions of interests between different actors– and illustrate how the framework to regulate pesticides is configured not only by legal structures rooted in scientific risk assessment processes but also by economic, socio-political interests, as well as the knowledge claims, institutional cultures and values of the different actors who participate in these contestations around knowledge claims. The debates bring out the expertise paradox where the actors question the ‘scientific’ rigour and hence the legitimacy of the decision-making process followed by the advisory bodies and the evidence informing the same but call for injection of more expertise to remedy the lacunae.

The dissertation goes on to argue that pesticide-use practices, as well as notions of risk, safety and uncertainty among farmers and farm workers in western Uttar Pradesh across caste, class, and gender, are shaped not only by the laws regulating pesticide-use but also by the nature of the pesticides themselves, the agroecology of farming systems, and engagements of farmers with various ‘agents of knowledge’ among other things. This brings out the diverse subjectivities within which pesticide use is embroiled and further underscores the perceptual weakness of the technocratic discourse around pesticide use that equates safety with regulation. The dissertation concludes that these understandings of the place-based nature of the pesticide-use complex, and

the structural drivers of agrarian change must be broadened to incorporate more-than-human assemblages to reconstitute the tropes, categories and frames through which pesticide use and exposure are understood.

सार

रासायनिक कीटनाशकों, उर्वरकों और उच्च उपज देने वाले बीजों को कृषि के उत्पादक रूपों में अपरिहार्य सामग्री माना जाता है। लेकिन, इन रसायनों के स्वास्थ्य और पर्यावरण पर प्रभावों को लेकर चिंताएँ समान रूप से व्यापक हैं। पिछले दशकों में, भारत में कीटनाशकों के उपयोग को विनियमित करने के लिए रूपरेखा तैयार करने वाला कानून, कीटनाशक अधिनियम १९६८ (इंसेक्टिसाइड्स ऐक्ट 1968), कृषि श्रमिकों के बीच विषाक्तता की घटनाओं, कीटनाशकों की उपस्थिति के कारण भारतीय मूल के निर्यात उत्पादों की अस्वीकृति, साथ ही कीटनाशकों और दीर्घकालिक स्वास्थ्य समस्याओं के बीच संबंध दर्शाते उभरते अध्ययन के कारण सार्वजनिक बहस का केंद्र रहा है।

यह डिसेटेशन, इस बात की जांच करती है कि भारत में कृषि कीटनाशकों के विनियमन की रूपरेखा और जोखिम, सुरक्षा, कारकता और कीटनाशकों के जोखिम के स्वीकार्य स्तर की प्रमुख धारणाएं परस्पर एक-दूसरे का गठन कैसे करती हैं। यह इंसेक्टिसाइड्स ऐक्ट 1968 और पेस्टिसाइड्स मैनेजमेंट बिल 2020 से

जुड़े

प्रतिभागियों जैसे नियामकों, वैज्ञानिकों (विष विज्ञानियों, कीटनाशक रसायनज्ञों, कीट विज्ञानियों) और उद्योग के प्रतिभागियों (जेनेरिक और अंतरराष्ट्रीय कंपनियों, नागरिक समाज संगठनों) और किसानों के प्रतिनिधियों के बीच बहस पर चर्चा करती है। यह बहस विभिन्न प्रतिभागियों के बीच हितों के अधिव्यापन और विरोधाभासों को सामने लाती है - और बताती है कि कैसे कीटनाशकों को विनियमित करने की रूपरेखा न केवल वैज्ञानिक जोखिम मूल्यांकन प्रक्रियाओं में निहित कानूनी संरचनाओं द्वारा बनती है, बल्कि आर्थिक, सामाजिक-राजनीतिक, प्रतियोगिताओं में भाग लेने वाले विभिन्न अभिनेताओं के ज्ञान के दावों, संस्थागत संस्कृतियाँ और मूल्य द्वारा भी आकृत की जाती हैं। यह बहस एक विशेषज्ञता के विरोधाभास को सामने लाती है, जहां प्रतिभागी 'वैज्ञानिक' दृढ़ता और सलाहकार निकायों द्वारा अपनाई जाने वाली निर्णय

लेने की प्रक्रिया की वैधता और इसकी जानकारी देने वाले साक्ष्यों पर सवाल उठाते हैं, लेकिन कमियों को दूर करने के लिए केवल और विशेषज्ञता की मांग करते हैं।

डिसर्टेशन में यह तर्क दिया गया है कि पश्चिमी उत्तर प्रदेश में विभिन्न जातियों, वर्गों और लिंग से आने वाले किसानों और खेत-श्रमिकों के बीच कीटनाशक-उपयोग और जोखिम, सुरक्षा और अनिश्चितता की धारणाएं, न केवल कीटनाशक-उपयोग को विनियमित करने वाले कानूनों द्वारा आकार लेती हैं, बल्कि स्वयं कीटनाशकों की प्रकृति, कृषि प्रणालियों की कृषि पारिस्थितिकी, और अन्य बातों के अलावा विभिन्न 'ज्ञान के एजेंटों' के साथ किसानों की भागीदारी से भी प्रभावित होती हैं। यह डिसर्टेशन, उन विविध विषयवस्तुओं को सामने लाता है जिनमें कीटनाशकों का उपयोग उलझा हुआ है और कीटनाशकों के उपयोग के जुड़े तकनीकी वार्तालाप की अवधारणात्मक कमजोरी को भी रेखांकित करता है जो सुरक्षा को विनियमन के बराबर मानता है।

डिसर्टेशन का निष्कर्ष है कि कीटनाशक-उपयोग कॉम्प्लेक्स की स्थान-आधारित प्रकृति और कृषि परिवर्तन के संरचनात्मक चालकों की समझ को विस्तृत किया जाना चाहिए ताकि मानव-से-अधिक संयोजनों को शामिल किया जा सके ताकि उन ट्रॉप्स, श्रेणियों और फ्रेमों को पुनर्गठित किया जा सके जिनके माध्यम से कीटनाशकों का उपयोग और एक्सपोज़र को समझा जाता है।

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LIST OF ABBREVIATIONS

Acceptable Daily Intake	ADI
Alliance for Sustainable and Holistic Agriculture	ASHA
Bharatiya Krishak Samaj	BKS
European Chemicals Agency	ECHA
European Food Safety Authority	EFSA
Contract Research Organizations	CRO
Central Insecticides Board and Regulatory Committee	CIBRC
Centre for Science and Environment	CSE
Crop Care Federation of India	CCFI
Crop life India	CLI
Department of Agriculture, Cooperation and Farmers Welfare	DACFW
Dichlorodiphenyltrichloroethane	DDT
Directorate of Plant Protection, Quarantine & Storage	DPPQS
European Food Safety Authority	EFSA
Federation of Indian Chambers of Commerce and Industry	FICCI
Food Safety and Standards Authority of India	FSSAI
Indian Agricultural Research Institute	IARI
Maximum Residue Limits	MRLs
Ministry of Agriculture Cooperation & Farmers' Welfare	MOAFW
Ministry of Health & Family Welfare	MOHFW
Ministry of Chemicals and Fertilisers	MoCF
National Centre for Integrated Pest Management	NCIPM
No Observable Adverse Effect Level	NOAEL
Organisation for Economic Cooperation and Development	OECD
Pesticide Action Network	PAN
Pesticide Management Bill	PMB
Pesticide Manufacturers and Formulators Association of India	PMFAI
Rashtriya Swayam Sevak Sangh	RSS
Special Investigation Team	SIT
State Agricultural University	SAU
Science and Technology Studies	STS
Swadeshi Jagaran Manch	SJM

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