PAN INDIA

DEEMED TO BE REGISTERED PESTICIDES IN INDIA

A.D. Dileep Kumar | P. S Athira

DEEMED TO BE REGISTERED PESTICIDES IN INDIA

July 2022

Author	:	A. D. Dileep Kumar (MSc., PGDPRM UCT, South Africa)
Research Support	:	P. S. Athira (MSc.)
Editor	:	Dr. Narasimha Reddy Donthi
Photos	:	A. D. Dileep Kumar
Layout & Design	:	Jino V Babu

About PAN India

Pesticide Action Network India (PAN India) is a public interest research and advocacy non-profit organisation formed in 2013. PAN India is a national independent organization in India, working closely with the PAN Asia Pacific and PAN international community. PAN India's objective is to help communities and governments to reduce dependence on toxic chemicals for pest control in agriculture, household as well as public health and to increase the use of sustainable alternatives. PAN India is committed to safe farming, safe living, and safe working place. PAN India is working to make India a world leader in Agroecology by empowering farming communities to keep away from toxic pesticides and agrochemicals, and to take up non-chemical methods of farming practices that champion traditional knowledge, biodiversity, and farmer participated research in attaining food sovereignty.

Contact
Pesticide Action Network (PAN) India
10/233/3, 1st Floor
Sarangi Complex
Chiyaram Post, Thrissur District
Kerala, India
PIN-680026
Phone: +91 487 2253737
Web site: www.pan-india.org
Email: admin@pan-india.org

Contents

List of Tables

List of Chart

ACKNOWLEDGEMENT

We wholeheartedly thank C. Jayakumar, Director of Pesticide Action Network (PAN) India to permit and entrust us to take up this important study, and also for handholding throughout the work. We would like to express our deepest gratitude to Dr. Narasimha Reddy Donthi, Policy Expert and Honorary Director of PAN India for guidance, technical support, review and mentoring throughout this work as well as for writing a preface to this report. We are gratefully to Dr. Indira Devi, steering committee member of PAN India for providing suggestions and guidance on the report.

We would like to place special thanks to Team Thanal for their moral support and encouragement for taking up this important work.

A.D. Dileep Kumar
P. S Athira

PREFACE

Regulations on agrochemicals exist at the state, national, and international levels. These regulations, variously, attempt to regulate the creation, distribution, use, and disposal of these toxic substances. Regulation of hazardous agrochemicals is critical to public health and environmental safety. Regulation ensures that they are not misused. When agrochemicals impact human health, and have the potential to cause serious, long lasting effects, research goes to develop new chemicals, which reduce such harm. In order to protect human health, these regulations must be up to date with scientific research. The regulation must become stricter, and companies that market toxic chemicals must work towards finding greener alternatives.

In order to protect the Indian population from harmful agrochemicals, years back government has brought out a law to regulate the use and distribution of agrochemicals, at a limited level. Insecticides Act, 1968, tries to regulate hazardous agrochemicals merely through registration and licensing. Procedures of such registration and licensing have been relaxed and eased to facilitate the growth of agrochemical usage in India. One such relaxation ie the provision for deemed registrations has been embedded in the law itself, ever since it has been enacted. As per this provision, agrochemicals that were in the market before the law was enacted were given deemed registration status. The deemed to be registered pesticide products were exempted from the process of registration and other legal formalities for scrutiny, including tests of safety.

Apparently, in the United States of America, 62,000 chemicals were in the market, before The Toxic Substances Control Act (TSCA) was passed in 1976. These chemicals are supposed to have been 'grand fathered' in – a typical American euphemism for deemed-to-be-registered. TSCA had little power to investigate them for safety. And, as per information available, during this Act's 40-year period only a little over 200 chemicals were assessed by regulation, out of roughly 85,000 chemical substances in the inventory. It is obvious that regulation has limitations in assessing the overwhelming number of chemicals being pushed into the market. However, this limitation on regulatory capacity cannot be further reduced by provisions that allow deemed registrations.

In India, information is not available on the existing status of pesticides, which are considered to be under deemed registration. This report tries to fill this information gap, through systematic research approach. Proposed Pesticide Management Bill 2020 tries to retain this deemed registration provision, without any scientific assessment. The new law should give powers to the regulatory authorities to obtain information on all agrochemicals, and mandates safety tests before they are permitted to be sold. PMB2020 should have clear legal, administrative and scientific prescriptions to ensure evaluation of hazardous agrochemicals and to restrict their usage. Instead of allowing agrochemicals through the deemed route, Indian regulation should make it a mission to assess and evaluate all agrochemicals transparently. Assessing and regulating these compounds require more capacity building in science and technology of pesticide impact analysis. India should build up a pool of scientific expertise for this purpose. Safety assessments should not be limited to evaluation of data submitted by the companies and it need to be undertaken at periodical intervals, even after the agrochemical has been approved for usage.

This report helps in shaping opinions on the provision of 'deemed to be registered pesticides' in India. We expect that the policymakers and research community to benefit from the consolidated information presented in this report.

Dr. Narasimha Reddy Donthi
(Public Policy Expert &
Steering Commitee Member of PAN India)

EXECUTIVE SUMMARY

Pesticide registration started in India in 1971. Pesticides used in India before 1971 are considered as 'deemed to be registered'. These pesticides thus did not undergo the mandatory scientific scrutiny process for evaluating their efficacy and safety. Information gathered through the provisions of Right to Information Act, 2005, in 2018 revealed that 62 pesticides are included in the list of deemed to be registered pesticides (DRPs). The list includes 29 insecticides, 14 fungicides, nine herbicides, four plant growth regulators, three rodenticides, one molluscicide and two antibiotics.

Based on the World Health Organisation's classification, 62.9% DRPs (39 pesticides), are included in the Class I - extremely and highly hazardous category, as well as Class II - moderately hazardous category of pesticides. According to PAN International's criteria, 66.13% DRPs (41 pesticides) qualify to be Highly Hazardous Pesticides (HHPs), where as 33.9% DRPs (21 pesticides) qualify to be HHPs as per JMPM criteria. About 27.45% of DRPs each shows either carcinogenic toxicity or endocrine disruption effect; and mutagenic and reproductive toxicity criteria are met by one pesticide each. Nearly 32% pesticides meet environmental toxicity criteria. About 72.6% (45) of the DRPs are banned in one or more countries, with 58% (36 pesticides) banned in more than 25 countries. About 29% DRPs (18 pesticides) are subject to multilateral international treaties on global chemical regulation.

Thirty-three DRPs were among the 66 pesticides banned elsewhere and used in India and were reviewed by an Expert Committee set up by the Ministry of Agriculture. This committee recommended phasing out or banning of many of the DRPs. As on March 2021, 20.97% (13 pesticides) of the DRPs were banned in India, and 8.1% (5 pesticides) were included in the category of restricted use products. A draft pesticide ban notification issued by the Government of India on 14th of May 2020 included 16 DRPs among others. However, final ban decision is yet to materialize. About 45% DRPs (28 pesticides) are being used in India without meeting the mandatory MRLs standard requirement. The 2004 direction of Agriculture Ministry prohibited registration of pesticides without prior fixation of their MRLs. The total number of pesticides registered for use in India (as on March 2021) was 293 and 16.72% (49 pesticides) of them are DRPs. Some of the deemed to be registered pesticides, for example, endosulfan and monocrotophos were implicated in public health disasters as well as several poisoning incidents in India.

Policy Recommendations Recommendations to Government of India

I.The Ministry of Agriculture and Farmers Welfare, Government of India has to withdraw registration certificates and ban all deemed to be registered pesticides in India with immediate effect.

II.'Deemed to be registered' category of pesticides should not be allowed in India henceforth.

III.The scheme 'Monitoring of Pesticide Residues at National Level' should include residue monitoring of all the 'deemed to be registered pesticides' in agriculture produce and analysis of biological and environmental samples collected from various States in India to understand the level and extent of contamination and take appropriate measures of decontamination.

IV.The national Centre for Organic Farming (Department Of Agriculture, Cooperation & Farmers Welfare, Government of India) should develop alternative non-chemical pest management methods for the crop-pest combinations for which DRPs are currently used in India, and promote them through the extension systems.

Recommendations to State Governments

1 State Agriculture Departments/Universities should urgently review the 'Package of Practices' or 'Crop Production Guides' and withdraw recommendation of deemed to be registered pesticides and inform farming communities through extension systems and promote alternative non-chemical pest management methods.

2 Public health departments and private agencies should avoid using DRPs in their anti-pest and anti-fungal operations in their functional areas.

INTRODUCTION

A Parliamentary Standing Committee on Chemicals and Fertilizers in 2013 noted that pesticides is a deregulated sector, though India is a net exporter as well as self sufficient in production of pesticide technical and their formulations[1] . Use of chemical pesticides started in India since 1948 and production started in 1952[2] . Pesticides are registered, approved and widely used in India for agriculture, public health, households, and for termite control in buildings. Indian pesticide sector was brought under regulation in the late 1960s. A legislation meant to regulate pesticides was brought in India during 1968 with the enactment of Insecticides Act 1968 and thereafter the Insecticide Rules 1971. This Act and Rules prescribes mandatory registration of pesticides in India among other regulatory aspects, both for manufacture and import, in order to ensure their efficacy and safety to human beings, animals and environment. The Registration Committee formed under the Act does three types of registration. They are (i) Provisional Registration on the basis of minimum data for two years for first time introduction of pesticides to facilitate complete data generation under section 9 (3B); (ii) an Original/Regular registration based on complete scientific data as per Registration Committee guidelines under Section 9 (3); (iii) and a repeat or 'me too' registration for the same pesticide on same conditions under section 9(4) as already granted under section 9(3)[3] . There are certain pesticides in India, which are known as 'deemed to be registered'. The practices of declaring 'DRPs' started in India after the Insecticides Act 1968 came in-to effect. All the pesticides that were used in India before the enactment of Insecticides Act 1968 were considered as DRPs. This report is an attempt to analyse this provision and its continued usage as a regulatory action.

Materials and Methods

List of deemed to be registered pesticides obtained through the provisions of Right to Information Act 2005 formed the basis of this report. These pesticides were analysed for various international and national pesticide regulatory requirements and standards such as WHO classification, status with respect to toxicity (Highly Hazardous Pesticide), legal status in India and other countries, and food safety protocols (MRL status in India). The observations are presented in the following sections.

Deemed to be Registered Pesticides (DRPs)

Many pesticides that are currently approved for use in India continue to be considered as 'deemed to be registered', escaping registration scrutiny process. A Joint Parliamentary Committee that considered the matter of 'Pesticide Residues in and Safety Standards for Soft Drinks, Fruit Juice and Other Beverages' reported in 2004, that "when the Insecticides Act came into being, there were certain pesticides that were already in use and they were called as 'deemed to be registered' pesticides. The basic problem relates to deemed to be registered pesticides were that the safety data has not yet been fully submitted by the industry. 71 pesticides out of the 181 registered for use in India during the period of the Committee, were 'deemed to be registered'[7] ".

Table 1 List of DRPs in India, as obtained through the provisions of Right to Information Act, 2005

#	Deemed to be Registered Pesticides
1	2,4 - Dichlorophenoxy Acetic Acid
2	Alachlor
3	Allethrin
4	Alphanaphthyl Acetic Acid
5	Aluminum Phosphide
6	Atrazine
7	Aureofungin
8	Barium Carbonate
9	Butachlor
10	Captan
11	Carbaryl
12	Carbofuran
13	Carboxin
14	Chlormequat Chloride
15	Copper Oxychloride
16	Copper Sulphate
17	Cuprous Oxide
18	Diazinon
19	DDT
20	Dichloropropene and Dichloropropane mixture
21	Dichlorvos;DDVP
22	Dicofol
23	Dimethoate
24	Dinocap
25	Diuron
26	Edifenphos
27	Endosulfan
28	Ethephon
29	Ethion
30	Ethylene dichloride and Carbon Tetrachloride mixture (EDCT mixture 3:1)
31	Fenitrothion
32	Fenthion
32	Fenthion
33	Gibberellic Acid
34	Lime sulphur
35	Malathion
36	Mancozeb
37	Metaldehyde
38	Methoxy Ethyl Mercury Chloride
39	Methyl bromide
40	Methyl Chlorophenoxy Acetic Acid
41	Methyl Parathion
42	Monocrotophos
43	Oxydemeton methyl
44	Paraquat dichloride
45	Phenthoate
46	Phorate
47	Phosalone
48	Phosphamidon
49	Propanil
50	Propoxur
51	Pyrethrin (Pyrethrum)
52	Quinalphos
53	Sodium cyanide
54	Streptomycin + Tetracycline
55	Sulphur
56	Thiometon
57	Thiram
58	Triallate
59	Trichlorfon
60	Zinc Phosphide
61	Zineb
62	Ziram

Source: Compiled based on the response received by the author to a query under the provisions of Right to Information Act, 2005 from the Central Insecticides Board and Registration Committee (CIB&RC) in early 2018.

A response received by the author to a query under the provisions of Right to Information Act, 2005 from the Central Insecticides Board and Registration Committee (CIB&RC) in early 2018 revealed that the number of pesticides deemed to be registered under the Insecticide Act is 62[8] . This number forms about 21 percent of the total registered pesticides in that year. List of DRPs are given in table 1.

The 2004 JPC report mentioned that there were 71 DRPs while the total registered pesticides was 181 in 2003 (the percentage of DRP was 39.25%). The RTI information on deemed to be registered pesticides was obtained during February 2018, and at that time total registered pesticides in India was 287 (as on 26th February 2018) and number of DRPs was 62; the percentage of DRPs then was 21.6. Nine DRPs were either banned or withdrawn between 2003 and 2017.

A farmer prepares pesticide mix for spraying without using PPE. Photo from Yavatmal

History of Pesticide Regulation in India

An accidental contamination of pesticides with food materials that resulted poisoning during late 1950s had paved the way towards legislation of pesticides in India[4]. The first recorded pesticide poisoning in India was reported from the South Indian State of Kerala in 1958. Several people were poisoned and over 100 deaths were reported in this incident due to contamination of food with a dangerous organophosphate insecticide named parathion[5]. Following this incident, Indian government appointed an enquiry commission. After that, an expert committee of Indian Council of Agricultural Research was formed to study all aspects of pesticide use and legislation. This consequently led to enactment of legislation to regulate pesticide sector with a view to prevent risk to human beings and animals from use of insecticides . The Insecticide Act 1968, and the Insecticides[6] Rules 1971 was framed to regulate import, manufacture, sale, transport, distribution and use of insecticides. Central Insecticides Board was formed to carryout advisory functions with regard to technical matters related to pesticides, and a Registration Committee was established for registering insecticides and for import lisencing . The Insecticides Act 1968 requires mandatory registration of pesticides in the country, both for manufacture and import, in order to ensure their efficacy and safety to human beings, animals and environment. After 40 years, Government of India had introduced 'Pesticide Management Bill 2008' in the Rajya Sabha, but it was not passed due to opposition from farmers and citizens. Nine years later a draft 'Pesticide Management Bill 2017' was brought and released for public comments in early 2017, and recently Pesticide Management Bill 2020 was introduced in the Rajya Sabha after the clearance from Union Cabinet by withdrawing the 2017 version. The 2020 bill is yet to be finalized; if and when passed it is expected to repeal the half a century old Insecticides Act, 1968.

One of the monocrotophos brands stalked in a retail shop in Tamilnadu

A. Toxicological overview of DRPs

WHO Classification: As per the World Health Organization (WHO) classification of pesticides based on acute hazard[9] , 4.84% (3 pesticides) of DRPs in India belong to the Class Ia, Extremely Hazardous category; 12.9% (8 pesticides) belong to Class Ib, Highly Hazardous category and 45.16% (28 pesticides) belong to Class II, Moderately Hazardous category. About 14.52% (9 pesticides) belong to Class III, Slightly Hazardous category; two pesticides (3.23%) belong to obsolete[i] category and four pesticides (6.46%) belong to the group, unlikely to present acute hazards in normal use. In the remaining, four pesticides (6.45%) are used as fumigants, and the rest are not included in the WHO classification.

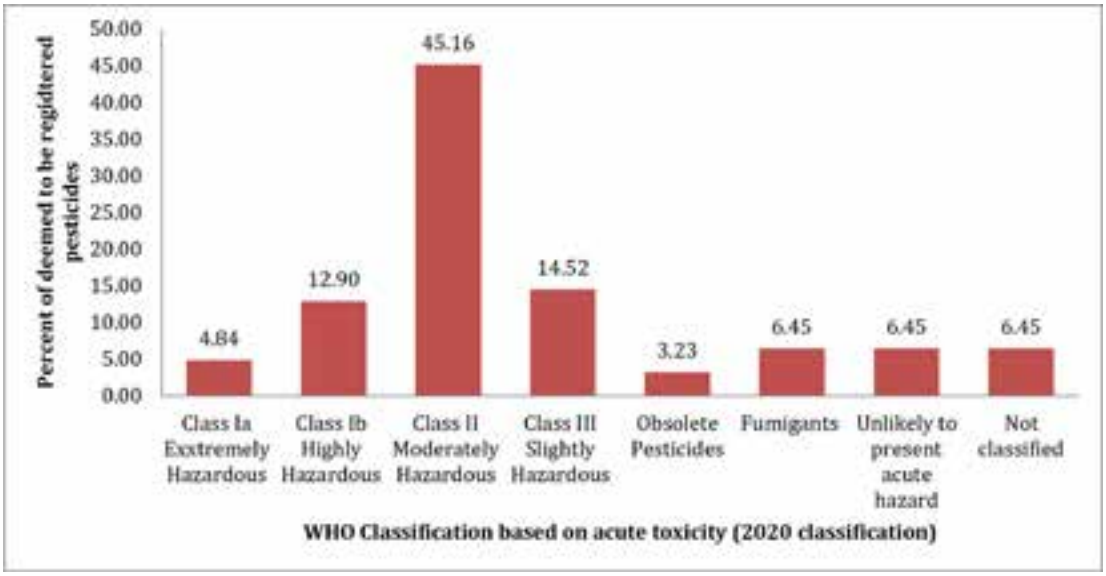
Table 2 WHO of classification (based on acute toxicity) of DRPs in India

#	Classifications	Number of DRPs	% of DRPs
1	Class Ia Extremely Hazardous	3	4.84
2	Class Ib Highly Hazardous	8	12.9
3	Class II Moderately Hazardous	28	45.16
4	Class III Slightly Hazardous	9	14.52
5	Fumigants (not classified based on acute toxicity)	4	6.45
6	Obsolete Pesticides	2	3.23
7	Unlikely to present acute hazard in normal use	4	6.45
8	Not included in WHO classification	4	6.45
Total		62	100

A farmer sprays pesticide without required safety precautions and PPE. Photo from Yavatmal

i Chemicals that are discontinued for use as pesticides

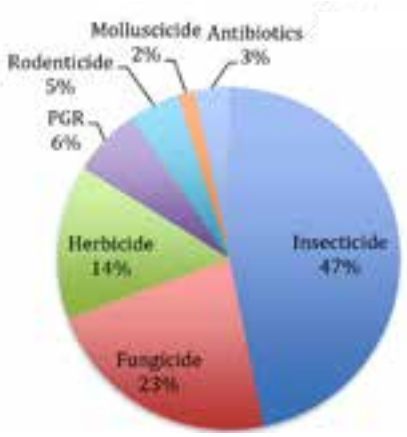
Chart 1 Distribution of DRPs according to WHO classification



Nearly half of them (29 DRPs) are insecticides, fourteen are fungicides and nine are herbicides, four are plant growth regulators (PGR), one is a molluscicide and the remaining two are antibiotics.

Table 3 Pesticide Use type for DRPs		
#	**Use type**	**Number of pesticides**
1	Insecticide	29
2	Fungicide	14
3	Herbicide	9
4	PGR	4
5	Rodenticide	3
6	Molluscicide	1
7	Antibiotics	2
Total		62

Chart 2 Use type Classification of DRPs



High Risk Pesticides among the DRPs

These DRPs were compared with internationally and nationally applicable regulatory criteria/standards. They were compared with highly hazardous pesticides (HHPs) criteria and pesticides banned in other countries as well as pesticides subject to international treaties and conventions. Further, they were compared with registered and banned pesticides in India. Many of the DRPs are HHPs and several of them are already banned in one or more countries and a few of them were banned in India as well. A detailed account on DRPs related to HHPs and those banned abroad as well as in India are given in the following section.

DRPS AND INTERNATIONAL REGULATIONS

I. Highly Hazardous Pesticides

The International Code of Conduct on Pesticides Management[10] define Highly hazardous pesticides as those 'pesticides that are acknowledged to present particularly high levels of acute or chronic hazards to health or environment according to internationally accepted classification systems such as World Health Organisation (WHO) or Globally Harmonized System of Classification and Labelling of Chemicals (GHS) or their listing in relevant binding international agreements or conventions. In addition, 'pesticides that appear to cause severe or irreversible harm to health or the environment under conditions of use in a country may be considered to be and treated as highly hazardous'. The FAO-WHO Joint meeting on Pesticides Management (JMPM) has recommended criteria[11] for identifying highly hazardous pesticides and is given in box 1. The JMPM criteria additionally addresses long term health effects such as Carcinogenicity (ability to trigger cancer) and Mutagenicity (ability to cause mutations in genes) as well as reproductive toxicity of pesticides among the criteria for HHPs. Whereas the PAN criteria meant for identification of HHPs, along with JMPM criteria, has additional health risk categories such as fatal if inhaled, endocrine disruptors (disrupt production and function of hormones), environmental and ecosystem toxicity.

All the DRPs are analysed (Table 4) to assess whether they qualify as highly hazardous pesticides categories as per the criteria set up by the FAO - WHO Joint Meeting on Pesticides Management (JMPM) as well as Pesticide action Network[12] (PAN) criteria for HHPs which has a broader criteria for identifying HHPs. The analysis revealed that 33.9% DRPs (21 pesticides) qualified as Highly Hazardous as per the JMPM criteria whereas 66.13% DRPs (41 pesticides) qualify to be Highly Hazardous as per the PAN criteria.

Table 4 List of HHPs among DRPs as per PAN and JMPM criteria and banned countries				
#	Name of DRPs	PAN HHP[ii]	JMPM HHP[iii]	No. of Countries Banned[13]
1	2,4 - Dichlorophenoxy Acetic Acid	x		3
2	Alachlor	x	x	110
3	Allethrin			1
4	Aluminum Phosphide	x		1
5	Atrazine			41
6	Butachlor	x		32
7	Captan	x		6
8	Carbaryl	x		40
9	Carbofuran	x	x	83
10	Diazinon	x	x	36
11	DDT	x	x	144
12	Dichlorvos;DDVP	x	x	37
13	Dicofol	x	x	50
14	Dimethoate	x		33
15	Dinocap	x	x	29
16	Diuron	x		29
17	Edifenphos	x	x	32
18	Endosulfan	x	x	128
19	Ethephon			1
20	Ethion	x		32
21	Ethylene dichloride and Carbon Tetrachloride mixture (EDCT mixture 3:1) (HHP status and ban in other countries applies to ethylene dichloride only.)	x	x	133
22	Fenitrothion	x		31
23	Fenthion	x		35
24	Malathion	x		32
25	Mancozeb	x	x	29
26	Metaldehyde			1
27	Methoxy Ethyl Mercury Chloride	x	x	1
28	Methyl bromide	x	x	34
29	Methyl Parathion	x	x	69
30	Monocrotophos	x	x	126
31	Oxydemeton methyl	x	x	31
32	Paraquat dichloride	x		48
33	Phenthoate	x		34
34	Phorate	x	x	61
35	Phosalone			31
36	Phosphamidon	x	x	55
37	Propanil			29
38	Propoxur	x		31
39	Quinalphos	x		31
40	Sodium cyanide	x		

ii As per PAN HHP List, March, 2021

iii According to PAN International Consolidated list of Bans, March 2021

41	Streptomycin + Tetracycline (Streptomycin is banned in 29 countries)			29
42	Thiometon	x	x	31
43	Thiram (Thiram is an hhp in formulations with benomyl and carbofuran)	x		28
44	Triallate	x		
45	Trichlorfon	x	x	77
46	Zinc Phosphide	x	x	2
47	Zineb			35
48	Ziram	x		2
	Total	41	21	

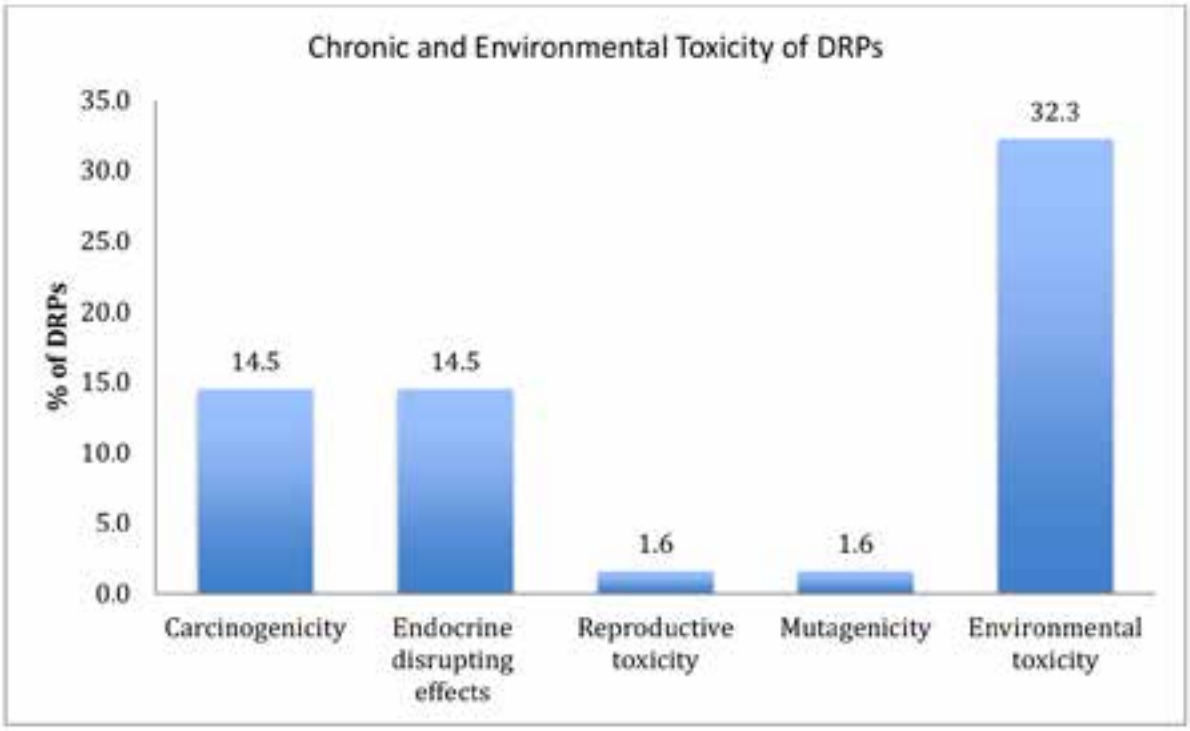
JMPM criteria for identifying HHPs

The FAO/WHO Joint Meeting on Pesticide Management [2008] recommended that highly hazardous pesticides should be defined as having one or more of the following characteristics:

- **Criterion 1**: Pesticide formulations that meet the criteria of classes Ia or Ib of the *WHO Recommended Classification of Pesticides by Hazard*;
  or
- **Criterion 2**: Pesticide active ingredients and their formulations that meet the criteria of carcinogenicity Categories 1A and 1B of the *Globally Harmonized System on Classification and Labelling of Chemicals* (GHS);
  or
- **Criterion 3**: Pesticide active ingredients and their formulations that meet the criteria of mutagenicity Categories 1A and 1B of the *Globally Harmonized System on Classification and Labelling of Chemicals* (GHS);
  or
- **Criterion 4**: Pesticide active ingredients and their formulations that meet the criteria of reproductive toxicity Categories 1A and 1B of the *Globally Harmonized System on Classification and Labelling of Chemicals* (GHS);
  or
- **Criterion 5**: Pesticide active ingredients listed by the *Stockholm Convention* in its Annexes A and B, and those meeting all the criteria in paragraph 1 of Annex D of the Convention;
  or
- **Criterion 6**: Pesticide active ingredients and formulations listed by the *Rotterdam Convention* in its Annex III;
  or
- **Criterion 7**: Pesticides listed under the *Montreal Protocol*;
  or
- **Criterion 8**: Pesticide active ingredients and formulations that have shown a high incidence of severe or irreversible adverse effects on human health or the environment.

Source: Guideline on Highly Hazardous Pesticides. FAO, 2016. http://apps.who.int/iris/bitstream/handle/10665/205561/9789241510417_eng.pdf;jsessionid=4295FE9355FDB09BB9E18BD752F447D4?sequence=1

Chart 3 Chronic toxicity of Deemed to be Registered Pesticides



Source: Compiled by the author based on the data presented in PAN HHP list

Comparison with PAN HHP criteria for long-term health effects shows that 9 DRPs (14.5%) each have carcinogenic toxicity and endocrine disrupting effects; one DRP (1.6%) each shows mutagenic and reproductive toxicity. The environmental toxicity criteria are met by 20 DRPs (32.3%), which includes toxicity categories such as high toxicity for bees, very persistent in water, soil or sediment, very toxic to aquatic organisms and bio accumulative.

Table 5 DRPs shows chronic toxicity

#	Chronic toxicity	Names of DRPs
1	Carcinogenicity	Butachlor, captan, diazinon, DDT, diuron, ethylene dichloride, malathion, mancozeb and propoxur.
2	Endocrine disrupting effects	2,4-D, alachlor, DDT, fenitrothion, mancozeb, quinalphos, thiram, trichlorfon, zineb.
3	Mutagenic	Carbaryl
4	Reproductive toxicity	Dinocap
5	Environmental toxicity	Aluminum phosphide, carbaryl, carbofuran, diazinon, DTT, dichlorvos, dimethoate, Fenitrothion, fenthion, malathion, monocrotophos, oxydemeton methyl, phenthoate, phorate, phosphamidon, propoxur, quinalphos, thiometon, triallate, trichlorfon.

II. DRPs banned in other countries

Comparison with PAN international list of consolidated ban shows that 45 DRPs (72.6%) are banned in at least one or more countries (Table 4). Among them, 9 pesticides (14.5%) are banned in at least one country and or less than 10 Countries. Twenty-seven pesticides (43.5%) were banned in 25 - 50 countries, five (8.1%) are banned in 50 - 100 Countries and the remaining four (6.5%) are banned in more than 100 Countries.

III. DRPs subject to international treaties and conventions

Twenty pesticides (about 32.26% of DRPs) are subject to regulations under the international conventions such as Montreal Protocol, Prior Informed Consent (PIC) procedure of the Rotterdam Convention and the Persistent Organic Pollutants (POPs) classification of the Stockholm Convention. One DRP is subject to the Montreal Protocol; whereas the Prior Informed Consent (PIC) procedure of the Rotterdam convention (annexed and candidate chemicals) is applicable to 14 DRPs and the Persistent Organic Pollutants (POP) list of Stockholm Convention is applicable to another three pesticides (Table 6).

Table 6 DRPs subject to international Treaties/Conventions

Montreal Protocol	PIC (Rotterdam Convention)[iv]	POP (Stockholm Convention[v])
Methyl bromide[vi]	1. Alachlor	DDT
	2. Carbofuran*	Dicofol
	3. DDT	Endosulfan
	4. Endosulfan	
	5. Ethylene dichloride	
	6. Methyl Ethyl Mercury Chloride	
	7. Methyl Parathion**	
	8. Monocrotophos	
	9. Phorate	
	10. Phosphamidon***	
	11. Thiram*	
	12. Trichlorfon	
	13. Fenthion#	
	14. Paraquat Dichloride#	

** Dustable powder formulations containing a combination of benomyl at or above 7%, carbofuran at or above 10% and thiram at or above 15%*

*** Methyl-parathion (Emulsifiable concentrates (EC) at or above 19.5% active ingredient and dusts at or above 1.5% active ingredient)*

**** Phosphamidon (Soluble liquid formulations of the substance that exceed 1000 g active ingredient/l)*

 # Chemicals recommended for listing in Annex III of Rotterdam convention. http://www.pic.int/TheConvention/Chemicals/RecommendedtoCOP/tabid/1185/language/en-US/Default.aspx

iv List of chemicals contained in Annex III of the Convention and subject to the Prior Information Consent (PIC procedure). http://www.pic.int/TheConvention/Chemicals/AnnexIIIChemicals/tabid/1132/language/en-US/Default.aspx

v POPs listed in the Stockholm Convention , http://chm.pops.int/TheConvention/ThePOPs/ListingofPOPs/tabid/2509/Default.aspx

vi UNEP Methyla Bromide https://www.unep.org/ozonaction/what-we-do/methyl-bromide

DRPS AND NATIONAL REGULATIONS

I. Decision of the Expert Review Committee: An Expert Committee was set up by the Ministry of Agriculture, Government of India in 2013 to review sixty-six pesticides which are banned or restricted or withdrawn in other countries but continue to be registered for domestic use in India. The list of 66 pesticides includes 33 (53.23%) of the 'deemed to be registered' pesticides. The Committee submitted its report in 2015 and observed severe health effects and environmental toxicity for most of them. The committee recommended that five of them (alachlor, dichlorvos, phosphamidon, phorate, and trichlorfon) be phased out by 2020; and eight of them namely carbaryl, DDT, diazinon, fenthion, methoxyethyl mercury chloride, methyl parathion, sodium cyanide, and thiometon, be banned in India. Use of fourteen pesticides (atrazine, butachlor, captan, carbofutran, dicofol, dimethoate, dinocap, diuron, malthion, mancozeb, monocrotophos, quinalphos and ziram and zineb) has been recommended for continued use and to be reviewed in 2018 as the committee had noted data lacunae. Five of the DRPs (aluminium phosphide, fenitrothion, metaldehyde, paraquat dichloride and zinc phosphide) was recommended for continued use. The committee did not assess endosulfan as it was sub-judice then.

II. DRPs and food safety regulations

According to the Food Safety and Standards (Contaminants, toxins and Residues) Third Amendment Regulations, as on 2018[14], only 34 of the 62 DRPs has Maximum Residue Limit (MRL) set for certain commodities in the country. The remaining pesticides are being used in the country without having the MRLs set for. In other words about 45% of the DRPs are being used in India without meeting the mandatory MRLs standard requirement in India. The Ministry of Agriculture, as early as in 2004 has directed the Central Insecticide Board and Registration Committee that no pesticide should be registered under provisions of Insecticides Act, 1968 without prior fixation of its MRLs except for bio-pesticides, pesticides meant exclusively for export, household/public health use and pesticides used for seed treatment which have little or no residue implications[15].

Analysis reveals that most of the DRPs are approved for insect/diseases/weed control in both food and non-food crop fields. The Ministry of Agriculture regularly conduct sample tests to monitor pesticide residues as per the national program on Monitoring of Pesticide Residues in India. According an RTI response received by the Author, less than 150 pesticides are tested in India to monitor residues of pesticides in agriculture products. An analysis shows that only 29 (46.77%) of the 62 DRPs are tested in India for residue monitoring, and the remaining DRPs are never part of the pesticide residue surveillance.

III. DRPs Banned and Restricted in India

List of pesticides which are banned, refused registration and restricted for use in India as on March 2021[16] shows that thirteen of the DRPs are banned in India (Table 7). However, two of them, dichlorvos and phorate, are allowed to continue to be manufactured for export purpose. Further, the formulation carbofuran 50% SP is banned for import, manufacture and use. Five pesticides are restricted to specific limited uses. The Ministry of Agriculture, Government of India issued a draft pesticide ban notification on 14th of May 2020, which included 16 DRPs among the 27 enlisted far ban. However, a final decision is yet to be taken.

Table 7 Regulatory status of some DRPs in India			
#	Banned		Restricted
1	Alachlor	1	Aluminium Phosphide
2	Carbaryl	2	DDT
3	Diazinon	3	Fenitrothion
4	Dichlorvos*	4	Methyl bromide
5	Endosulfan	5	Monocrotophos
6	Fenthion		
7	Methoxy Ethyl Mercury Chloride		
8	Methyl Parathion		
9	Phorate*		
10	Phosphamidon		
11	Sodium cyanide		
12	Thiometon		
13	Trichlorfon		
14	Carbofuran 50% SP formulation banned for import, manufacture and use		

** Though banned, they are allowed to continue to manufacture for export.*

IV. DRP Currently registered for use in India: As on March 2021, 293 pesticides are registered for use in India under section 9(3) of the Insecticides Act, 1968[17]. This includes 49 (79.03%) of the 62 deemed to be registered pesticides, which forms 16.72 % of the pesticides registered for use in India.

PUBLIC HEALTH CONSEQUENCES OF USING DRPS IN INDIA

Several public health impacts caused by pesticides can be seen in the recent history of India. Thousands of accidental, occupational and self-poisonings are reported in the country. A number of DRPs were involved in these unfortunate incidents harming life of several thousands of people. A few important public health issues caused by pesticides, which are 'deemed to be registered' in India are given below.

I. Endosulfan Disaster in Kasaragod: Endosulfan is a WHO Class II insecticide. This organochlorine insecticide had been aerially sprayed in the cashew plantations in Kasaragod District in the South Indian State of Kerala for over 20 years from1978. Consequent to this, a complex of severe health outcomes hitherto unknown, were noted among the community in Kasaragod since early 1980s, which includes congenital anomalies, physical deformities, neurological disorders, mental health impairments, disorders related to hormonal irregularities, defective reproductive health, developmental health disorders, different types of cancers, respiratory and immune systems disorders[18]. The Supreme Court of India banned endosulfan in 2011 in the country, and later in 2017 ordered to pay compensation to the victims of endosulfan poisoning[19]. Being a Persistent Organic Pollutant, the Stockholm Convention in 2011 had decided to phase out Endosulfan globally.

II. Monocrotophos Poisonings in India: Monocrotophos is a WHO class Ib insecticide. It is widely used in India though a restricted pesticide since 2005. This organophosate insecticide has been implicated in several pesticide-poisoning incidents in India[20], including accidental, occupational and self-poisonings. A WHO report on 'Health implications from monocrotophos: a review of evidences in India' presented several incidences of monocrotophos poisoning. Later, moncrotophos was involved in the death of 23 school children in Bihar in 2013, and a couple of devotees in Karnataka in 2018[21] due to contamination of food items. It was involved in occupational poisoning incidents of hundreds of cotton farmers and workers in Maharashtra[22] and Tamilnadu in 2017.

These tragedies, can be regarded as a failure of pesticide regulatory system in India. Pesticide legislation was brought in India with a view to prevent risk to human beings and animals from use of pesticides, ensuring mandatory registration after evaluation of efficacy and safety. Apparently, endosulfan and monocrotophos escaped scrutiny process as they were given the status of 'deemed to be registered pesticides'. They became the cause of public health disaster, harming thousands of lives. There could be other DRPs involved in poisonings. If these 'deemed to be registered' pesticides were properly scrutinised before being allowed for use, toxic effects of such DRPs on the citizens and ecology could have been prevented.

How DRPs impacted regulation of pesticides in India

The Ministry of Agriculture regulates the manufacture, sale, transport and distribution, export, import and use of pesticides through the 'Insecticides Act 1968' and the rules framed there under. It is the Registration Committee (RC), which is responsible for registering pesticides for specific crop-pest combinations after verifying the claims of the manufacturers or importers related to the efficacy and safety of the concerned products. Pesticide registration process was initiated in India after the Insecticide Rules 1971 came into being. However, those pesticides

which were used in India before the Insecticide Act 1968 came into being were considered as 'Deemed to be Registered' since then. These pesticides, designated as DRPs, were allowed for use without undergoing the mandatory scrutiny process, including for their bio efficacy and baseline toxicity data.

This flaw was mentioned in the report submitted by the expert committee under the chairmanship of Dr. Anupam Verma that reviewed 66 pesticides in India in 2015. This report, in its general recommendation, specifically recommended that "all deemed to be registered' pesticides need to be re-evaluated for their bio-efficacy as per approved label claims and baseline toxicity data against major target pests may be generated by the registrant before December 2017", means that these pesticides were not properly assessed with efficacy and toxicity data before. Thus, the DRPs, many of them are already banned abroad due to health and environmental concern are continued to use in the country without undergoing mandatory safety assessments.

Impact of DRPs on agriculture, food and ecology

It is a reality that India has been using several pesticides without having undergone registration scrutiny process for more than 50 years. Many of the DRPs lacked data on efficacy, persistence, residues and baseline toxicity. As these critical regulatory data sets were not available, many of the DRPs never have precautionary waiting periods set for the crops they are approved for. In the same manner, many DRPs do not have set MRLs for farm produce, and hence residue-monitoring data is also not available. Therefore, information on the level and the extent of contamination of food products with many of the DRPs in India remains unknown. However, some of the DRPs such as dicofol, dimethoate, ethion, malathion, monocrotophos, and quinalphos were identified for their residues in the report of the monitoring of pesticide residues at national level 2017-18[23]. This indicates contamination of food and agriculture produce with DRPs. Over more than 50 years, huge amounts of such pesticides have been used in India. A nationwide comprehensive study is required to understand contamination of food products and pollution of soil, water and ecosystems due to DRPs.

Is India moving away from DRPs?

Based on the available official documents, it is evident that 13 DRPs were banned between 2003 and 2020. In 2013, a committee was appointed to review the pesticides banned or severely restricted elsewhere and continues to be used in India. The committee reviewed 66 pesticides, which included 33 of the DRPs. Later in May 2020, Ministry of Agriculture proposed a ban of 27 pesticides by a draft notification. Out of this 27, 16 were DRPs. However, a final decision on the ban is yet to come. The pesticide legislation in India, continues to harbour support for DRPs. Apart from the existing provision in the 50-year-old Insecticide Act 1968, the proposed Pesticide Management Bill 2020 has included provisions related to DRPs. This means that the regulatory laxity will continue with new legislation as well.

Pesticide Management Bill 2020 and DRPs

Proposed PMB 2020 has provision for DRPs. A pressing concern regarding registration of pesticides is the provision for 'deemed to be registered' in the PMB (Clause 23) for those products, which were registered under the Insecticides Act 1968. This provision should not be allowed. All pesticides should be reviewed based on common criteria and must follow the registration and scrutiny process. The number of pesticides deemed to be registered under the Insecticide Act 1968 , is 62. Many pesticides that are currently approved for use in the country are

'deemed to be registered' escaping registration scrutiny process for biosafety. The draft bill has retained the 'deemed to be registered' provisions that will allow these 62 pesticides (except those banned if any) and may be more to be in use even though their impacts have not been assessed for biosafety and efficacy. Such a provision should not be part of the proposed Bill.

One of the monocrotophos brands stalked in a retail shop in Tamilnadu

A paraquat dichloride applied cofee field in Wayanad, Kerala

One of the Dimethoate brand stalked in a retail shop in Tamilnadu

Paraquat dichloride sold in plastic carrying bags.Photo from West Bengal 2015

CONCLUSION

About 17 percent of pesticides registered for use in India fall under the legal status of deemed to be registered as on March 2021, These pesticides, did not undergo the registration scrutiny process meant for evaluating their efficacy and safety to human beings and environment. Many of these pesticides are highly hazardous and a quarter of them are subject to international treaties. Some of the DRPs were reported in severe poisonings and public health disasters in India. Further mounting volume of literature is available on the risks to environment and human health upon exposure to such chemicals. It is not desirable that 'deemed to be registered' provision be further continued in the proposed PMB 2020. Considering the public health and environmental risks of pesticides, no pesticides should be allowed to be used without scientific scrutiny of need, efficacy, health risk and environmental safety.

REFERENCES

1. Parliamentary Standing Committee on Chemicals and Fertilizers (2012-13). Report 36, Production and Availability of Pesticides. Department of Chemicals and Petrochemicals. Ministry of Chemicals and Fertilizers. Government of India. 2013. Lok Sabha Secretariat.

2. Bhardwaj, T., & Sharma, J. P. (2013). Impact of pesticides application in agricultural industry: An Indian scenario. International Journal of Agriculture and Food Science Technology, 4(8), 817–822

3. Phogat, B. S. 2013. Pesticide Regulation in India – an overview. Proceedings of the "International Conference on Emerging Issues on Health Effects of Pesticide Residues in Food and Environment - unmet challenges and research opportunities", 12 -13 December 2013. Organized by Food and Drug Toxicology Research Centre. National Institute of Nutrition, ICMR, Hyderabad.

4. Ibid

5. Karunakaran, C.O., 1958. The Kerala food poisoning. J. Indian Med. Assoc. 31, 204–205.

6. Web site of Plant Protection Quarantine and Storage, Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and farmers Welfare, Government of India. *http://ppqs.gov.in/divisions/cib-rc/about-cibrc*

7. Report of the Joint Committee On Pesticide Residues In And Safety Standards For Soft Drinks, Fruit Juice And Other Beverages. Lok Sabha Secretariat. 2004. *http://loksabhaph.nic.in/writereaddata/InvestigativeJPC/Investigative-JPC_635612535872380463.pdf*

8. Response revived to query on Deemed to be registered pesticides from The Central Insecticides Board and Registration Committee, 2018. (F no. 21-09/2018-CIR-I)

9. WHO 2020. The WHO recommended classification of pesticides by hazard and guidelines to classification: 2019. World Health Organization.

10. FAO and WHO, 2014. The International Code of Conduct on Pesticide Management. World Health Organization and Food and Agriculture Organization of the United Nations. *www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/CODE_2014Sep_ENG.pdf*

11. FAO, 2016. Guideline on Highly Hazardous Pesticides. *http://apps.who.int/iris/bitstream/handle/10665/205561/9789241510417_eng.pdf;jsessionid=4295FE9355FDB09BB9E18BD752F447D4?sequence=1*

12. PAN, 2021a. PAN International List of Highly Hazardous Pesticides. Pesticide Action Network International. *https://pan-international.org/wp-content/uploads/PAN_HHP_List.pdf*

13. PAN, 2021b. PAN consolidated list of Bans. Pesticide Action Network International. *https://files.panap.net/resources/PAN-Consolidated-List-of-Bans.xlsx*

14. FSSAI, 2018. Food Safety and Standards (Contaminants, toxins and Residues) Third Amendment Regulations, 2018. *https://archive.fssai.gov.in/dam/jcr:632659f8-11f7-4dd6-9c3a-37d2d4750e15/Gazette_Notification_MRL_Pesticides_03_01_2019.pdf*

15. Letter of Department of Agriculture and Cooperation, Ministry of agriculture, Government of India to the secretary, CIB&RC, dated 16th August 2004. F.No.17-4/96-PP.I (VolIIIB)

16. CIB&RC. List of Pesticides, which are banned, refused registration and restricted use, as on 1st march 2021. *http://ppqs.gov.in/sites/default/files/list_of_pesticides_which_are_banned_refused_registration_and_restricted_in_use.pdf*

17. CIBRC. Insecticides and Pesticides registered under section 9(3) of the Insecticides Act 1968 for use in the country as on 1st March 2021. Central Insecticide Board and Registration Committee, Directorate of Plant Protection, Quarantine and Storage, Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and farmers Welfare, Government of India. *http://ppqs.gov.in/sites/default/files/insecticides_registered_under_section_-_93_as_on_01.03.21.pdf*

18. DILEEP KUMAR, A. D. and JAYAKUMAR, C. (2019) "From Precautionary Principle to Nationwide Ban on Endosulfan in India," Business and Human Rights Journal. Cambridge University Press, 4(2), pp. 343–349. doi: 10.1017/bhj.2019.9.

19. Democratic Youth Federation of India v Union of India and others [2011] Supreme Court of India (Civ) 213.

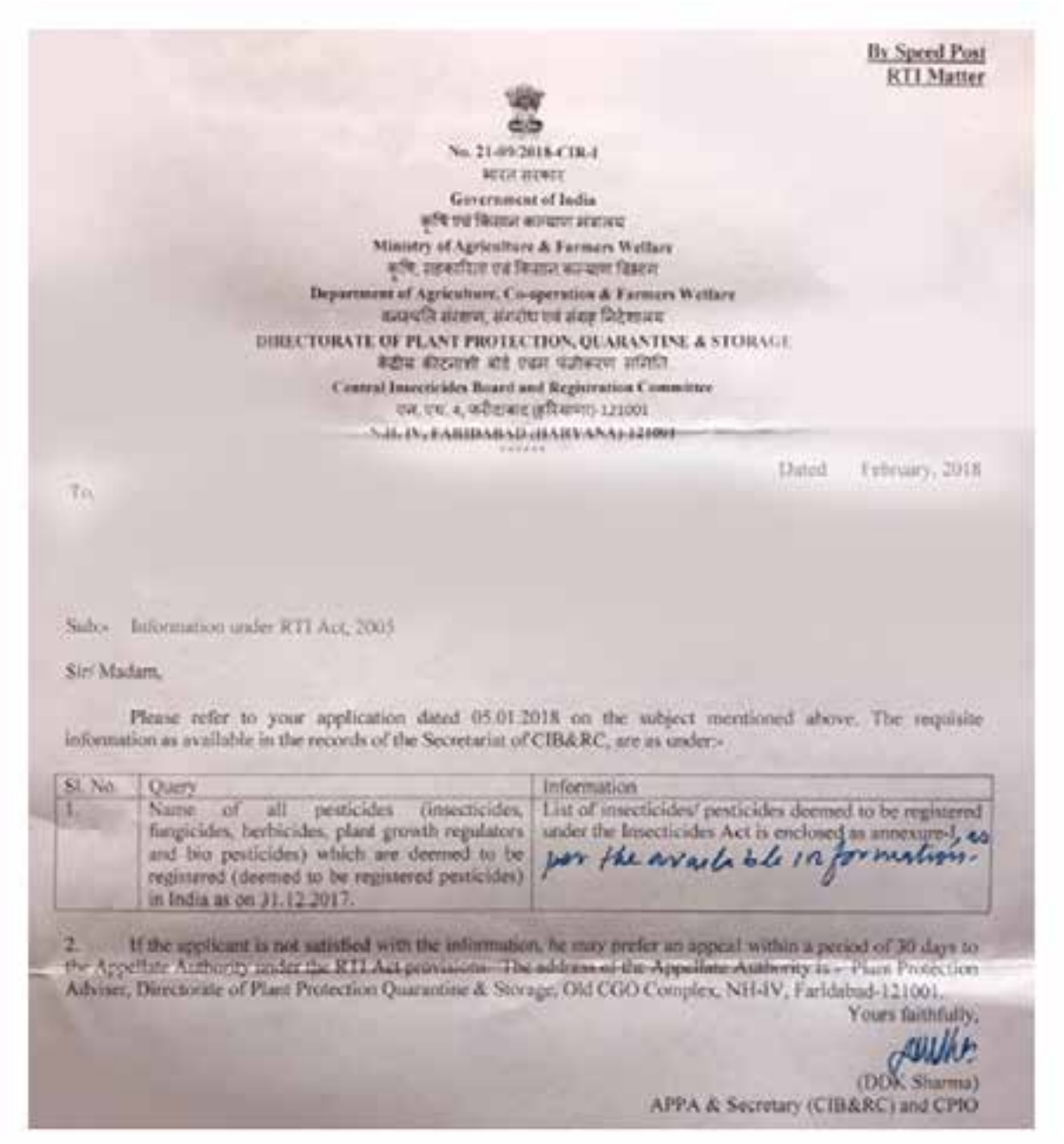
20. WHO 2009. Health implications from monocrotophos: a review of evidences in India. World Health Organisation

21. Sonam, T, J. 2018. Pesticide that killed Karnataka devotees has a sordid record in India. Down to Earth Report *https://www.downtoearth.org.in/news/food/pesticide-that-killed-karnataka-devotees-has-a-sordid-record-in-india-62532*

22. Reddy, N., and Kumar, D., 2017. Pesticide Poisonings in Yavatmal District in Maharashtra: Untold Realities. PAN India. *http://www.pan-india.org/wp-content/uploads/2017/10/Yavatmal-Report_PAN-India_Oct-2017_web.pdf (accessed Sept. 30, 2017)*

23. FSSAI notification dated 16th October 2019. *https://www.fssai.gov.in/upload/advisories/2019/10/5da705b31ca78Letter_Report_Pesticides_MRL_16_10_2019.pdf.pdf*

Annexure 1
RTI response on deemed to be registered
Pesticides



By Speed Post
RTI Matter

No. 21-09/2018-CIB-I

Government of India
Ministry of Agriculture & Farmers Welfare
Department of Agriculture, Co-operation & Farmers Welfare
DIRECTORATE OF PLANT PROTECTION, QUARANTINE & STORAGE
Central Insecticides Board and Registration Committee
FARIDABAD (HARYANA)-121001

Dated February, 2018

To,

Sub:- Information under RTI Act, 2005

Sir/ Madam,

Please refer to your application dated 05.01.2018 on the subject mentioned above. The requisite information as available in the records of the Secretariat of CIB&RC, are as under:-

Sl. No.	Query	Information
1.	Name of all pesticides (insecticides, fungicides, herbicides, plant growth regulators and bio pesticides) which are deemed to be registered (deemed to be registered pesticides) in India as on 31.12.2017.	List of insecticides/ pesticides deemed to be registered under the Insecticides Act is enclosed as annexure-I, as per the available information.

2. If the applicant is not satisfied with the information, he may prefer an appeal within a period of 30 days to the Appellate Authority under the RTI Act provisions. The address of the Appellate Authority is :- Plant Protection Adviser, Directorate of Plant Protection Quarantine & Storage, Old CGO Complex, NH-IV, Faridabad-121001.

Yours faithfully,

(DDK Sharma)
APPA & Secretary (CIB&RC) and CPIO

ANNEXURE-I

List of Insecticides / Pesticides Deemed to be Registered under the Insecticides Act, 1968

	Name of the Pesticide
1.	2,4-Dichlorophenoxy Acetic Acid
2.	Alachlor
3.	Allethrin
4.	Alphanaphthyl Acetic Acid
5.	Aluminium Phosphide
6.	Atrazine
7.	Aureofungin
8.	Barium Carbonate
9.	Butachlor
10.	Captan
11.	Carbaryl
12.	Carbofuran
13.	Carboxin
14.	Chlormequat Chloride (CCC)
15.	Copper Oxychloride
16.	Copper Sulphate
17.	Cuprous Oxide
18.	Diazinon
19.	Dichloro Diphenyl Trichloroethane (DDT)
20.	Dichloropropene and Dichloropropane mixure (DD mixure)
21.	Dichlorvos (DDVP)
22.	Dicofol
23.	Dimethoate
24.	Dinocap
25.	Diuron
26.	Edifenphos
27.	Endosulfan*
28.	Ethephon
29.	Ethion
30.	Ethylene Dichloride and Carbon Tetrachloride mixture (EDCT Mixture 3:1)
31.	Fenitrothion
32.	Fenthion
33.	Gibberellic Acid
34.	Lime Sulphur
35.	Malathion
36.	Mancozeb
37.	Metaldehyde
38.	Methoxy Ethyl Mercury Chloride (MEMC)
39.	Methyl Bromide
40.	Methyl Chlorophenoxy Acetic Acid (MCPA)
41	Methyl Parathion
42	Monocrotophos

43	Oxydemeton-Methyl
44	Paraquat dichloride
45	Phenthoate
46	Phorate
47	Phosalone
48	Phosphamidon
49	Propanil
50	Propoxur
51	Pyrethrin (pyrethrum)
52	Quinalphos
53	Sodium Cyanide
54	Streptomycin + Tetracycline
55	sulphur
56	Thiometon
57	Thiram
58	Triallate
59	Trichlorfon
60	Zinc Phosphide
61	Zineb
62.	Ziram

Endosulfan*:- Endosulfan has been banned by the Supreme Court of India w.e.f. 13-05-2011 for production, use & sale, all over India, till further orders vide ad-Interim order in the Writ Petition (Civil) No. 213 of 2011.

Pesticides used in India before the formal 'registration process' started following the Insecticides Act 1968 are considered as 'Deemed to be Registered'. These pesticides thus did not undergo the mandatory scientific scrutiny process for evaluating their efficacy and safety, and most of them are continue to be used in the country. Many of them are highly hazardous pesticides and subject to international regulatory frameworks. The new 'Pesticide Management Bill 2020' favors the provision for 'deemed to be registered' that will allow 62 pesticides (except those banned if any) to continue to be in use. This report suggests that as mounting volume of literature is available on pesticide toxicity, no pesticides should be allowed to be used without scientific scrutiny of need, efficacy, health risk and environmental safety.

PAN INDIA

Pesticide Action Network (PAN) India
10/233/3, 1st Floor, Sarangi Complex, Chiyaram Post
Thrissur District, Kerala, India - 680026
Phone: +91 487 2253737 | www.pan-india.org | admin@pan-india.org