

AN APPRAISAL OF AGROCHEMICAL POLLUTION IN INDIAN.

by

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ABSTRACT

Though agrochemical pollution is world wide problem. But specially developing nations are suffered a lot for agrochemical pollution. Though India is a growing economy but India is also considered as developing nation in front of international community. In India people are also suffered due agrochemical pollution. Excessive use of agrochemical beyond the fixed standard prescribed by concern laws has an adverse impact on environment and side by side on public health. Only registered and approved agrochemical can be used. Due to unawareness and lack of knowledge farmers sometimes used unapproved agrochemical or if uses approved agrochemical but few of them are applying beyond fixed standard. Excessive use of agrochemicals and use of unapproved agrochemicals causes reduction of soil quality, contamination of water, health issues of public including farmer. Though there are some laws to control agrochemical pollution ad. These laws are not properly implemented. TO stop the pollution there is need of more specific laws with strict implementation. Farmer should be properly trained and basic awareness should be spread among public regarding adverse impact of agrochemical pollution.

KEY WORDS: ADVERSE, IMPACT, AGROCHEMICAL POLLUTION, ENVIRONMENT, PUBLIC HEALTH, REGISTERED, NON REGISTARED

INTRODUCTION: In present days agrochemical pollution is a growing concern for not only the society but it is concern of entire country. Agrochemical Pollution has adverse impact upon the environment of our country like other countries of the world. India also having problem of agrochemical pollution. Vigorous generic pesticide

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industries are developing in India. There are some competent organizations such as institute of pesticide. Industrial agriculture is regulated through agrochemicals e.g. fertilizers, pesticides, insecticides. As per the report of food and agriculture organization of united nations in the year of 2013 reported that 1563 billion of hectares of arable land with permanent crops available up to 2012. 75% is located in low- medium income countries². According to the report of world Health Organization 3 millions of health related cases raised regarding use of pesticide poisoning have occurred in developing and under developed nations³ Use of huge amount agrochemicals have adverse effects on whole environment (soil, water, air) including biodiversity.

DEFINITION OF ENVIRONMENT: Environment of an object means surroundings of object. According to sec.2(a) “Environment includes water, air, land human beings, other living creatures, plants and micro- organism and property.”⁴ All the living beings including human beings are the products of environment. Environment contributes to develop personality of people of a country. If people of any country can maintain sustainability between environment and development through application of principles sustainable development. Sustainable development can promote the overall growth of the country. Industrialization is necessary for the economic growth of a country. If the climate change environment pollution adversely affects the world. If entire will be in such condition which is not suitable for human existence human being will do with economic growth of a country. If we cannot stop immediately environment pollution then existence of human being will be in danger in near future.

POLLUTANTS OF AGRICULTURE: There are pollutants which are responsible for reduction of crops production and other agricultural damages. These are as follows:

²https://www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/publikationen/Chemical_Pollution/ChemPoll-LAMICS_Chapter2.pdf. (retrieved on 10.07,2025 at 8.08 p.m.)

³ https://www.researchgate.net/publication/375485756_Agrochemicals_and_Their_Impact_on_Environment (retrieved on 11.07.2025 at 7.45 p.m.)

⁴ THE ENVIRONMENT PROTECTION ACT; 1986; SEC,2(a)

Pesticides: Pesticides are the materials used for preventing or to destroy, control pests of including undesired species of animals and plants. In course of production, storage, transportation, distribution and through out the processing food and other agricultural commodities and animals' foods. Ectoparasites which means a parasite that lives externally on the body on another animal but not lethal for that animal immediately. But in long run these parasites can harm or may kill the animal and plants as well.

There are reasons to use pesticides these are as follows: i) pesticides are used to protect the reaping crops from pests and from plants diseases.

ii) To improve the harvesting quality use of pesticide is necessary.

iii) To control and reduce the disease among human and animals⁵.

Insecticides: Material which is used for preventing, killing and controlling insects is known as insecticides. Chemical based insecticides are classified as:-

Inorganic compounds: Arsenicals, fluorine compounds etc.

Organic compound: DDT, HCH, Carbaryl, prorate (organophosphate insecticide)

Botanic Compound: Nicotine, sulphate, pyrethrum etc.

In case of modes of entry of insecticides are classified by 4 system.

Entry through stomach; DDT HCH these are organochlorine compound used as insecticide these are applied through food and entry through stomach during feeding which causes stomach poisons of insects and which helps to kill the insects from agricultural process and make sure insect free harvesting.

Other 3 systems are- contact poison, fumigants, systematic insecticides etc⁶.

⁵ HAND BOOK OF AGRO CHEMICAL INDUSTRIES; EIRI;P-16

⁶ HAND BOOK OF AGRO CHEMICAL INDUSTRIES; EIRI;P-27

Herbicides: Chemical material which is used by farmers to kill unwanted plants including parasites this kind of material known as are herbicide. Herbicides are basically used for elimination of plant growth or killing of unwanted plants which are growing in a place where they are not necessary to grow. We can take Weeds as an example growing and spreading of weeds can cause reduction of crops growth and also reducing amount of water from soil. There is a high probability of degradation of quality of soil. Weeds in agricultural seeds or ingrain caused degradation in quality of grains.

It may cause harm to human, animals and to plants also not only weeds unwanted plants like wild barley which may cause physical to human and animals to their mouth or to their feet. Unwanted plants compete for carbon dioxide for their photosynthesis process.

To prevent the herbicides some measures must be taken:

- i) Use of impure farm seeds must be prohibited.
- ii) There must be some laws to regulate the quality of farm seeds used for agriculture.
- iii) firmly equipment and necessary machines used in agricultural product processing should be kept clean from herbicides
- iv) Retain healthy and pure grains as far as possible from stopping or spreading parasite further.
- v) Mowing i.e. cutting of unwanted plants from growing.
- vi) destroying seeds of unwanted plants.
- vi) grazing by animals which is similar to mowing⁷.

Toxicity and safe use of pesticides: Toxicity of pesticides are not dangerous if it is used within the scientific range which is required for agriculture. of huge amount of pesticide in agricultural field among whole world it can be seen specially in low-

medium income countries. Acute toxicity is a kind of toxicity of an organisms of pest by pesticide⁸. Acute toxicity is of primary interest of people who are engaged in manufacturing process of pesticides. Toxicity of this kind of pesticides can cause damage to the health of the people who are directly involve in formulation process of pesticides⁹.

Chronic toxicity is dangerous if it is extended for long period of time and as an adverse effect of use of pesticide toxin of pesticide assimilated in animals with regular diet. 1 milligram per kg. of body weight that dose can kill 50% of test animals if 1 milligram extends the scientific dose measured for lab test. Animals in laboratory generally rats, pigs and rabbits are used for experiment. Toxicity defined as lethal dose. That can breakout through air, water and all surroundings of animal which one was taken for experiment in laboratory¹⁰.

Big economies of world like UK USA provided advice and assistance to low- middle income countries where regulation, environment regulations, pollution control, lack of public awareness regarding agrochemical pollutants and about their adverse effect in human life¹¹. Pesticides should be used within range which was fixed by various scientific tests in laboratory.

Adverse effects of insecticides: In one side insecticide can kill and control insects from causing harm to the crops and the entire harvesting process. If used amount of insecticides are beyond scientifically fixed range then it will adversely affect human health and the environment. Excessive application of caustic soda can harm quality of

⁸ HAND BOOK OF AGRO CHEMICAL INDUSTRIES; EIRI; P-199

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https://www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/publikationen/Chemical_Pollution/ChemPoll-LAMICS_Chapter2.pdf (Retrieved on 26.07.2025 at 7.35p.m.)

¹⁰ HAND BOOK OF AGRO CHEMICAL INDUSTRIES; EIRI;P-201

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https://www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/publikationen/Chemical_Pollution/ChemPoll-LAMICS_Chapter2.pdf (Retrieved on 26.07.2025 at 8.05p.m.)

soil and also can reduce production of crops beyond limit use of insecticide is harmful for the total environment surroundings of agricultural field.

Impact OF Fertilizers: In the field of agriculture fertilizers are used for rapid plant growth and maximum production of crops. But these fertilizers are having some negative impacts on elements of environment. These are as follows:

i) Degradation of soil equality: Fertilizers improve soil quality and side by side in long run it can degrade fertility capacity and quality of land. In agricultural field fertilizer are used for rapid harvesting. Fertility of that particular land will be reduced being used for a long-time because fertilizers disturb the natural balance of soil nutrients. Use of fertilizer are having both the possibilities of positive and negative effect on soil health¹². Fertilizer helps to promote rapid growth of plants. Fertilizer can reduce fertility capacity of soil and can cause imbalance of soil nutrients as a result of which quality of soil will be reduced. Dependence on inorganic fertilizers can cause imbalance of soil variance of nutrients therefore quality of agricultural land will be reduced. Fertility capacity will be deteriorated and soil erosion can be increased¹³.

ii) Water Pollution: water which carries fertilizer and effluents of agricultural field flows over the earth surface that portion of land with suffer by the negative impacts of water. When this mixed water falls into the river and adversely affect the aquatic life and aquatic ecosystem. Due to the contamination of river water ground water is also polluted. If any animal dinks the contaminated water that animal will suffer by health issues. If the ground water was taken by human without filtration human body will be surely infected. Fertilizer mixed water can contaminate ground water with nitrates and phosphates¹⁴.

¹²<https://farmerline.co/the-impact-of-fertilizers-on-the-environment-inorganic-vs-organic/> (Retrieved on 01.08.2025 at 7.15 p.m.)

¹³<https://farmerline.co/the-impact-of-fertilizers-on-the-environment-inorganic-vs-organic/> (Retrieved on 1.08.2025 at 7.50 p.m.)

¹⁴ <https://farmerline.co/the-impact-of-fertilizers-on-the-environment-inorganic-vs-organic/> (Retrieved on 3.08.2025 at,7.32 p.mm)

iii) Atmosphere: Those gases which are based on nitrogen released from fertilizer mixed soil. These gases can make the whole atmosphere poisonous. Fertilizer based on ammonia which can cause emission of nitrous oxide. Which is one of greenhouse gases. Greenhouse gases can absorb the radiation will be responsible for climate change and increase of temperature which is the reason of global warming.

Impact Of Veterinary Pharmaceuticals: Veterinary medicine is used to protect animals for their diagnosis and treatment. But unprocessed veterinary drugs are discharged in various water bodies. Veterinary medicine manufacturing factories are discharging effluents of veterinary medicine. Therefore, effluents mixed water can contaminate water which can adversely affect the aquatic ecosystem and land on which contaminated water flows, act antibiotic used in veterinary medicine manufacturing that can cause degradation of quality of soil and water and may cause harm to under water life.

IMPACT OF AGROCHEMICAL POLLUTION ON SOIL: Excessive use of synthetic fertilizers, pesticides and insecticides including herbicides will adversely affect the organic elements of soil, microbiology of soil and microbiological enzymes of soil. In harvesting of legume plants species over use of agrochemical can cause rhizobium- legume symbiosis where good bacteria are fixed by nitrogen in structured as nodules in the root of the legume plants¹⁵. Beneficial micro-organism for soil can be killed by application of agrochemical because of increased nitrate level in soil. Nutrients of soil can be imbalanced due to application of agrochemicals¹⁶. Agrochemicals can reduce the fertilization capacity of rest of the land in the agricultural field. Agrochemical can cause reduction of water quantity from soil¹⁷. Over use of pesticides has negative

¹⁵ https://www.researchgate.net/publication/375485756_Agrochemicals_and_Their_Impact_on_Environment (Retrieved on 10.08.25 at 8.00 p.m.)

¹⁶ Residues to the soil health.)

¹⁷ Just agriculture. (2024).

impact on total ecosystem of soil¹⁸. All the agrochemicals can cause harm to the microorganism and biodiversity with ecosystem. Beneficial bacteria, fungi, earthworms can be killed due to agrochemicals¹⁹.

IMPACT OF AGROCHEMICALS ON WATER: When agrochemicals flow with water and falls in water bodies as run off or floated effluents of agrochemical industry or as parasite of soil falls into the water bodies directly. When agrochemicals applied to control aquatic pests, mosquito larvae, leaches and other insects which are floated from soil with herbicide and insecticide can cause negative impact on aquatic ecosystem under water life can be adversely affected. Due to the mixture of agrochemicals with water quality of water will be deteriorated²⁰.

IMPACT OF AGROCHEMICALS ON AIR: Released pollutant from agrochemicals in the atmosphere causes air pollution. Application of pesticide directly enter into air during the time of application of pesticide on the field. Therefore, particles of pesticide, insecticide or fertilizers directly mixed in atmosphere²¹. This mixed atmosphere mixed with agrochemical particles caused air pollution. However polluted air is responsible for environment pollution as well. Hence, polluted air will adversely

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¹⁸ Certain for Biological Diversity (2021) pesticide and soil health.

¹⁹ https://www.researchgate.net/publication/375485756_Agrochemicals_and_Their_Impact_on_Environment (Retrieved on 11.08.2025 at 7.47 p.m.)

²⁰ <https://farmerline.co/the-impact-of-fertilizers-on-the-environment-inorganic-vs-organic/> (Retrieved on 12.08.2025 at 7.15 p.m.)

²¹ https://www.researchgate.net/publication/328796919_IMPACT_OF_AGRICULTURE_ON_AIR_POLLUTION (Retrieved on 18.08.2025 at 8.00 p.m.)

affect nearby wildlife, people living in near about areas and also it can harm the total ecosystem of concern area²².

IMPACT OF AGROCHEMICAL ON HUMAN HEALTH: According to world health organization due to acute pesticide poisoning affects approximately 3 million people and causes 20,000 deaths(approximately) per year²³. Illness, cancer, reproductive diseases and complications, neurological disorder, respiratory diseases and other health issues caused for excessive use of agrochemicals²⁴.After subjection of pesticides have adverse effect on human body causes malfunctions in the brain and also causing damage to whole nervous system of body²⁵. Agrochemicals like growth booster used for plant growth and also used in fisheries for quick weight growth of fishes. These medicines are harmful for human if chemical injected vegetables, plants, fishes taken by human as their food. This is the main t cause of low immunity power of body, diabetes, cancer, genealogical problems ²⁶.immunological abnormalities in human body caused due to agrochemicals are used in plants, fisheries and in poultry farms, goat farms and also cow farming for milk production are responsible for various diseases in human body²⁷.

²²<https://www.annualreviews.org/content/journals/10.1146/annurev-environ-120920-111015> (Retrieved on 18.08.2025 at 8.00 p.m.)

²³https://www.mcgill.ca/pfss/files/pfss/agrochemicals_and_their_impact_on_human_health.pdf (Retrieved on 19.08.2025 at 7.41p.m.)

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https://www.researchgate.net/publication/358070401_Impact_of_agrochemicals_on_the_environment_and_human_health_The_concerns_and_remedies (Retrieved on 19.08.2025 at 8.10)

²⁵ Agricultural Chemical Pollutants;Chemical pollution in Low-AND-MIDDLE-INCOME COUNTRIES; p-33

²⁶ Of

humanhttps://www.researchgate.net/publication/370059696_Effect_of_pesticide_and_heavy_metal_toxicants_on_fish_and_human_health (Retrieved on 21.08.2025, at 7.35 p.m.)

²⁷ <https://pubmed.ncbi.nlm.nih.gov/8505035/> (Retrieved on 21.08.2025 at 8.07.)

INITIATIVES TAKEN TO CONTROLL AGROCHEMICAL POLLUTION: There are many initiatives has been taken to control agrochemical pollution some of them are as follows:

- i) If necessary, user should take proper training and advice regarding application of agrochemicals in agricultural field.
- ii) Registered lowest toxicity to harm mammals' birds and other animals that kind of agrochemicals should be selected by farmers.
- iii) Agrochemicals which are banned and prohibited to use. These fertilizers or other agrochemicals cannot be used farmers if used it will be actionable by law.
- iv) There is several equipment of spray but which one ideal for safety for human health end environment that particular safe agrochemical spray equipment should be used by users.
- v) Though there are specific environment management system to stop spreading of pesticide and insecticides in atmosphere and also to stop run off fertilizers through water in others] lands and fall into water bodies. There is a need of purification of pesticide mixed water and purification of fertilizer mixed water²⁸.
- vi) Appropriate dose for better agriculture and pollution free environment how much dose of agrochemical should be applied in agricultural field that must be specified by the agricultural and by expert environmentalists.

ROLE OF ROTTERDAM CONVENTION ON PRIOR INFORMED CONSENT PROCEDURE FOR CERTAIN HAZARDOUS CHEMICALS AND PESTICIDES IN INTERNATIONAL TRADE (1998): Main objective of this convention is to develop mutual understanding regarding cooperation among parties in international trade of

²⁸ https://www.researchgate.net/publication/375485756_Agrochemicals_and_Their_Impact_on_Environment (Retrieved on 2.09.2025 at 7.33 p.m.)

specific hazardous chemicals to protect the environment and human health²⁹. Australia, Argentina, Brazil, Belgium, China, Colombia, Denmark, European Community, Finland, Germany, Hungary, Israel, Italy, India, these are some of the parties of this convention.

Chemical means mixture of some material which are collected from nature and preparation of new material but it does not include any living organism. But includes pesticides, insecticides, fertilizers which are made by hazardous chemicals used in formulation of pesticide³⁰.

According to Article 2(b) Banned chemical means chemical all uses of which within one or more categories which are forbidden by this convention. Through the regulatory action for protection of human health and environment. Chemicals which are not approved by the authentic authority or rejected by industry those products which are not approved by authentic authority for domestic market. Domestic approval is necessary. There must be evidence of domestic approval of products, however it must be satisfied that use of the will not harm human health and environment³¹.

Area Of Application of this convention: scope of this convention deals with banned or prohibited agrochemicals, hazardous pesticide formulation also applies to narcotic drugs, wastes, chemical weapons, pharmaceuticals, human, veterinary drugs, food chemicals, specified chemical quantity which will not affect human health or environment provided that amount which is approved under this convention³². Agrochemicals should be taken

²⁹ Article 1 Rotterdam convention.)

³⁰ Article 2 (a) Rotterdam Convention, 1998.

³¹ <https://cer.org.za/wp-content/uploads/1999/01/Rotterdam-Convention.pdf> , (Retrieved on 4.09.2025 at 8.15 p.m.)

³² Article 3,) Rotterdam Convention, 1998.

for purpose of research or analysis; how much quantity should be used by farmer for agricultural purpose that must be specified by experts³³.

Prior Information Consent under Rotterdam Convention: It is popularly known as PIC (Prior Information Consent) under Rotterdam convention, 1998. PIC is formal procedure of equal responsibility and cooperation among parties to international trade. Previously in 1998 there was no mandatory concept of prior informed Consent procedure. This concept set off as legally compulsory 24 February 2004. Though there was PIC in Rotterdam convention but it was not compulsory on the 1998 but it was made mandatory and legally binding from 2004.

Main objectives of PIC are as follows: i) To assist shared responsibilities between exporting and importing countries.

ii) To prevent unwanted trade of banned chemicals.

iii) Spread awareness among countries about the side effects of hazardous agrochemicals.

Function Of PIC: Main functions of prior informed consent procedure are as follows:

1. If a party country bans or prohibits any agrochemical due its hazardous nature that country must serve a notice to the Secretariat of Rotterdam convention.

2. After that a body of experts will be appointed as chemical Review Committee to examine the risk of adverse impact on human health or on environment, use of hazardous chemical.

3. If after examination it is clear that use of this chemical is risky for human health and environment then that committee will provide a decision guidance document with the help of scientific and regulatory information.

³³ Article 3, Rotterdam Convention, 1998.

4. Then that decision guidance document will be shared with all the member countries of this convention.

5. Each and every party has a right to decide they will allow the import or not ; they will prohibit the import or not.

6.Finally every exporting country will respect the decision of importing country³⁴.

This convention specially includes pesticides like aldrin, DDT, Chlordane etc. In industrial chemical includes asbestos, perchlorinated biphenyl or PCB.

Agrochemicals which are considered as prohibited those are should be listed in one list but those which agrochemicals are safe for trade and not harmful environment these agrochemicals should be mentioned in another list. But both the list of agrochemicals either harmful or non-harmful will be updated time to time³⁵.

INDIAN LAWS REGULATIONS ON AGROCHEMICAL POLLUTION CONTROL: -

Though there are many laws to protect environment and human health. Some of laws are as follows:

Insecticide Act,1968 will be replaced by pesticide Management Act,2020: if any person is willing to import or manufacture of any insecticide. Immediately should register under the registration committee for registration of insecticide and there shall be different application for different insecticides³⁶. On receipt of application for the registration of an insecticide committee after enquiry if it deems fit and satisfied that insecticide is safe for human, animal health and environment. Then the insecticide can be registered with

³⁴<https://www.pic.int/en-us/procedures/picprocedure.aspx> (Retrieved on 09.09.2025. at 11,20 a.m.)

³⁵ <https://www.fao.org/4/i0783e/i0783e00.pdf> (Retrieved on 09.09.2025 at 7.50 p.m.)

³⁶ Section 9 of Insecticide Act, 1968; section 16 of Pesticide Bill, 2020.

payment of prescribed fees. After registration a registration certificate will be issued³⁷. Though in 1968 there was no such provision of Regarding digital registration that, But Pesticide Management Bill 2020 has provision that the state shall maintain the procedure of pesticide can be registered through digital medium which will be maintained by National registration committee under the bill. Registration of pesticides in digital form must be avail for in website maintained National registration committee for digital registration³⁸.

Environment Protection Act, 1986: According to this Act, prohibition and restrictions about handling of hazardous substance in different areas. This Act empowers the Government to decide the process of cleaning the polluted environment, keep then environment pollution free and set the standard of polluted element for example how much waste, smoke chemicals can be released in air or water³⁹. Environment Protection Act, 1986 provided that central government can decide the standard of elements of air, water soil and air, water soil quality of different areas for different purposes⁴⁰. section 3 (2) (d) provided procedures and safeguards for the prevention of accident through pollution can spread in environment for that reason remedial measure should be taken for such incident⁴¹. Any industry. No person can carry out industrial operation or other processes and discharge of effluents permission of discharge should taken from authenticate authority. Discharge of environment pollutant in excess of such standards prescribed under this Act⁴². According to sec.8 no person shall handle any hazardous substance only by following the procedures and taking safeguards prescribed under this Section⁴³.if the excess discharge of any environment pollutant caused which is excess of

³⁷ Section 9 (3) of INSECTICIDE ACT, 1968.

³⁸ Pesticide Management BILL, 2020.

³⁹ Section 3 (2) (c) Environment Protection Act, 1986

⁴⁰ Section 3(2)(a) of Environment Protection Act, 1986

⁴¹ Environment Laws; Bare ACT,; PROFESSIONAL BOOK PUBLISHERS;P-4

⁴² Environment Protection Act;sec-7

⁴³ ENVIRONMENT LAWS, BARE ACT, professional book publishers; p-20

prescribed standard due to any accident or by negligence or for any other reasons,. Therefore, person responsible the discharge, who is shall bound to obey directions of higher authority. If any one fails to comply with provisions of this Act or contravenes any provision or direction provided by this Act shall be subjected to imprisonment which may extend to 5 years or with fine which may extend to 1 lakh. If contravention continues with 1 lakh R.S, 5000 R.S will be added per day.⁴⁴ But if the contravention continues beyond 1 year after the date of conviction, the offender shall be punishable with imprisonment which may extend to seven years⁴⁵.

Water Prevention and Control of Pollution Act, 1974: According to section 23(c) water prevention and control of pollution Act, pollution means either contamination of water or alteration of physical, chemical or biological elements of water , therefore discharge of any pollutant (sewage effluents) sewage form of liquid. Gaseous or solid substance in water and create that water as harmful and injurious to public and .animal's health and environment , also injurious to public safety. This kind of water should be use for domestic, commercial industrial, agricultural use . if this water use it can kill other animals, cause harm to human life also can damage aquatic life⁴⁶. According to section 2 (g) provided that sewage effluent or effluents from sewage system or sewage disposal works includes sullage from open drains⁴⁷. No person shall knowingly allowed to discharge any poisonous, noxious or pollutant discharge amount of which are fixed with standard prescribed by state or central board dispose into stream, well or river even in case of discharge of polluted water on land is also restricted and fixed by standard⁴⁸.

⁴⁴ Section 15 (1) , ENVIRONMENT PROTECTION ACT, 1986

⁴⁵ Section 15 (2) ENVIRONMENT PROTECTION ACT, 1986

⁴⁶ Section 2€ of Water Prevention And Control OF Pollution Act 1974

⁴⁷ ENVIONMENT LAWS, BARE ACT, professional book publishers; p-48

⁴⁸ ENVIONMENT LAWS, BARE ACT, professional book publishers; p-62

No one can set up a industrial operation or process or make drains sewer, pipe for discharge of industrial effluents without obtaining prior consent from state pollution board⁴⁹.

If any industry established without prior permission of state board or contravenes sec.25 persons responsible for the establishment shall be punished with imprisonment of 6 month which may extend to 6 years with fine⁵⁰.

Air(Prevention and Control of pollution Act, 1981: According to Air pollution Act, pollutant includes solid liquid or gaseous substance and noise present in the atmosphere, such assemblage may tends to cause injury to human beings or to other animals and plants or to the entire environment⁵¹. Presence of any pollutant in atmosphere, is air pollution⁵².

The Air prevention and control of pollution Act, 1981 , empower the state government with the authority to

- i) Declare any area as air pollution control area which will be strict on emission of pollutants,
- ii) Government can fix a standards of emission of air pollutants from industrial plants within that specified area⁵³

No industrial plant including agrochemical manufacturing plants can be established without prior approval of State Board⁵⁴.

⁴⁹ Section 25 of Water(Prevention and Control of pollution), Act, 1981

⁵⁰ Section 44 of of Water(Prevention and Control of pollution), Act, 1974

⁵¹ Section 2(a) Air Prevention and Control of Pollution Act,1981

⁵² Section 2(b)) Air Prevention and Control of Pollution Act,1981

⁵³ Section 19; Air Prevention and Control of Pollution Act,1981

⁵⁴ Air Prevention and Control of Pollution Act,1981; Section 21

Section 22 of Air Pollution Act provided that no person can cause emission of pollutants beyond the standard fixed by law. Section 22 also provides no fertilizer or pesticide industry emit pollutants beyond limit of discharge permitted under state pollution control Board⁵⁵. According to section 31A of Air(Prevention and Control of Pollution)Act, 1981, central board or state board has power to issue directions including disclosure of industry or prohibition of industrial process or regulations of industry also can be directed by the boards. This direction can be issued against agrochemical plants for causing . harmful emission⁵⁶.

Hazardous Waste Management, Rule,2016:Hazardous waste includes manufacture, formulation and use of pesticides, herbicides, fungicides etc.

Hazardous waste means any waste which is characteries such as physical, chemical biological toxic, explosive or flammable or elements to cause danger to health and environment either or alone or with assemblage of other things of environment may transfer to into poisonous substance including processed waste, remainder, mud and slush from agrochemical manufacturing factory, also includes rejected container and other used products⁵⁷. Following steps will be taken by the hazardous waste management to clean the environment, these are as follows:

- i)Prevention
- ii) Reduction(minimization)
- iii) Recover
- iv)Reprocessed(recycling)

⁵⁵ Air Prevention and Control of Pollution Act,1981; Section 22

⁵⁶ ENVIRONMENT LAWS, BARE ACT, professional book publishers; p-32

⁵⁷ Rule3 (17) Hazardous Waste Management Rule, 2016

v)Utilization, Co -processing

vi)Convert waste into a pollution free element.

vii) safe disposal⁵⁸ .

Every owner, occupier of company has a duty to proper handling, generation, collection, storage, packaging, use, transportation, treatment, processing disposal of waste. Above mentioned duties will be served-

- a) With the consent of State Pollution Control Board
- b) State Government may develop an integrated plan for fruitful implementation of rules specified under Hazardous waste management rule, 2016 , in concern state and state can submit report about its waste management to the Ministry environment, forest and climate change of India⁵⁹.If possible through utilization of hazardous wastes in modern days from hazardous waste biofuel can be produced. Spreading awareness among people about adverse effect of hazardous waste on human health, Systematic collection of waste with transportation of collected waste then safe processing to produce biofuel or measure should be taken for safe disposal of hazardous waste⁶⁰.

Import and export of Hazardous and other wastes deals by rule 13 of hazardous waste management Rule 2016 are as follows:

- i)Prohibition of import of any hazardous substance and other wastes from any country shall be permitted from disposal in India.

Import is allowed only for utilization or if recovery and rescue possible then .

Export of hazardous substance and other wastes can be carried out only with the prior consent of authentic authority, after obtaining no objection certificate from the importing country⁶¹.

⁵⁸ Rule 4; Hazardous Waste Management Rule, 2016

⁵⁹ Rule 5 of Hazardous Waste Management Rule, 2016

⁶⁰ Hazardous Waste Management Rule, 2016; Rule, 9

⁶¹ Rule 13, Hazardous Waste Management Rule, 2016; Rule-13

Essential Commodities Act, 1955: This Act deals with production, supply and distribution of essential commodities such as foodgrains, edible oils, medicinal drugs, fertilizer, pesticides, petroleum products etc. This Act focused on quality checking of products and secure their fair prices of markets.

Fertilizer Control order, 1985: FCO (fertilizer control order), 1985 passed under Essential Commodities Act, 1955. Most important provision of this order is as follows: Only specified fertilizers mentioned in schedule may be manufactured, imported or can be sold. Harmful unapproved agrochemicals are prohibited to manufacture, import and export⁶².

Restriction on manufacture, import, sale and distribution of fertilizer, Therefore any fertilizer which is not prescribed standard specified in schedule of FCO.

Any fertilizer contains harmful ingredients that make it injurious to soil, crop or human and animal health.

If fertilizer not registered under provisions of the order.

If fertilizer adulterated with any food element, then that mixture reduces its nutrient value or makes it unsafe for human body or unsafe for animals⁶³.

Every manufacturer/ importer or handling agency must assure that fertilizers are sold only:

- i) In approved containers and
- ii) container must bear appropriate label and details
- iii) fertilizer is not mixed adulterated with any other substance.

Sale of non-standard or misbranded fertilizers are prohibited⁶⁴.

If fertilizer is not meeting the standard mentioned under Essential Commodities Act, 1955. Then that fertilizer will be disposed of by taking safe measures without

⁶² Clause 19; Fertilizer Control Order, 1985.

⁶³ Clause 20; Fertilizer Control Order, 1985.

⁶⁴ Clause 21; Fertilizer Control Order, 1985

harming the environment.⁶⁵ Main purpose of this clause is to protect environment from agrochemical pollution.

Clause 24 of Fertilizer empowers the state government to appoint fertilizer inspector who can inspect fertilizer manufacturing units, storage and safe points,

Take sample for examination

Check and ensure acquiescence with standard mentioned under FCO⁶⁶

Main objective of this clause is to proper handling of fertilizer and reduction of misuse and accidental pollution.

Restricted Use of Pesticides in India: Some of the pesticides are restricted for use in India. Some of them are as follows⁶⁷:

1. **Aluminium phosphide:** It is not allowed to sold in open market for common people(farmers). But it can be sold only to government undertaking organizations and must be under strict supervision of government appointed pest control experts.
2. **Benzene Hexachloride(BHC):** Application of BHC on vegetables, fruits, crops and for preservation of foodgrains banded in India.
3. **D.D.T.:** Agricultural use of D.D.T is banned in India. It is harmful for public health and also harmful for environment. Use of 10,000 MTS per annum is restricted.
4. **Chlorobenzoate:** use of chlorobenzoate in agriculture is prohibited in India. If there is necessary requirement then it can be imported by government.
5. **Dieldrin:** Use of Dieldrin is restricted for desert areas to control locust control to protect the remain plants of desert area. But this used by government approved pest control

⁶⁵ Clause 23; Fertilizer Control Order, 1985

⁶⁶ https://upagripardarshi.gov.in/MediaGallery/FCO_Act.pdf (Retrieved on 18.10 2025 at 11,05 a.m.)

⁶⁷ HAND BOOK OF AGRO CHEMICAL INDUSTRIES; EIRI;p-24-25

official as per the direction of government, But use of this pesticide in other agricultural land of country is strictly prohibited.

6. **Methyl Bromide:** User whose expertise is approved by plant protection advisor to Govt. of India. It can be used by experts in a form of spray as fumigant.
7. **Captafol:** Use of captafol as foliar spray is banded.
8. **Nicotine Sulphate:** Nicotine sulphate can be produced only for export, but use of nicotine sulphate is strictly prohibited in India.

Some of the approved pesticides for use in India are as follows:

- i) Calcium arsenate
- ii) EPN
- iii) Azinphos- methyl
- iv) Lead Assonate
- v) Ammonium sulphate etc.
- vi) Vamidothion etc⁶⁸.



Some of the banned pesticides are as follows: pesticides which are completely banded some of them are chlordane, BHC, Aldrin, Heptachlor, Nitro fen, toxaphene, Ethyl parathion etc⁶⁹.

CONCLUSION: Adverse impact of agrochemical pollution on environment and on public health is a serious problem in India. In India common people especially rural farmers unaware about the adverse effect of agrochemical pollution. Use of agrochemical beyond the fixed standard prescribed by relevant laws. Excessive use of

⁶⁸ HAND BOOK OF AGRO CHEMICAL INDUSTRIES; EIRI;p-23

⁶⁹ HAND BOOK OF AGRO CHEMICAL INDUSTRIES; EIRI;p-24

agrochemical can reduce fertilization capacity of soil. Agrochemical not only reduces soil quality but also causes contamination of water sources. Use of unapproved or non-registered agrochemical causes health risk to farmers. People who are taking crops of the agricultural field, will be suffered by various diseases. In rural areas due to unhygienic storage of food and contamination of food so many people suffered by various diseases some of them suffered by lethal disease. Many people died because of lethal diseases which is result of agrochemical pollution. Long term misuse of agrochemical can destroy the biodiversity and cause harm to ecosystem of environment. Sustainable agriculture can be collapsed due to agrochemical pollution. Unapproved agrochemicals shall decrease the food security. There are some legislations to prevent agrochemical pollution and to protect the environment and public health. But there is no proper implementation of laws. Unawareness among people and increasement of département corruption is responsible for non-implementation of laws. Rural farmers including rural people must have knowledge about use and misuse and adverse impact of agrochemical on environment and on public health. In on side some farmers are using approved or registered agrochemical within fixed standard prescribed by law . But Another side few among the rural famer not following any law uses non register agrochemical. Only education and awareness can stop them from using unapproved agrochemicals. To stop them from causing harm to environment and also from causing harm to their own health. Therefore, government should provide people specially farmer proper education regarding agriculture and adverse impact of agrochemical pollution. Government should provide them proper training to use agrochemical without causing harm to their own health and environment. To protect the environment and public health there is need of strict admiration to proper implementation of laws. Though there are some relevant laws on agrochemical pollution control. But there is need of more specific direct laws to stop agrochemical pollution in India.



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